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THE FOUNDRY TRADE JOURNAL IS THE OFFICIAL ORGAN OF THE INSTITUTE OF BRITISH FOUNDRYMEN; THE WELSH ENGINEERS' AND FOUNDERS' ASSOCIATION, AND THE FOUNDRY TRADES' EQUIPMENT AND SUPPLIES ASSOCIATION.

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Further Tariff Points.

Further consideration of the new tariff schedule printed in our issue of April 28 has brought out several points of interest to the trade. The first is the omission of pig-iron. Pig-iron apparently carries a duty of 10 per cent. in accordance with the first schedule, but this has not been increased, as is the case with most iron and steel products. Spiegeleisen and ferro-manganese are covered. Pig-iron, of course, is an important raw material for many British industries, and it is well known that during the past few years heavy imports of pig-iron have taken place, whereas the export is now small. In Scotland we have seen the extraordinary phenomenon of foundries finding it more profitable to use imported Indian pig-iron than Cleveland pig-iron. Even if pig-iron were taxed, however, Indian pig would doubtless receive preferential treatment. This will be the more obvious when it is considered that in the iron and steel section, ingots manufactured from charcoal-smelted pig are excepted from schedule 2. The reason for this is obvious, for the material to which reference is made is Swedish pig, and is admitted at the low rate in the interests of the Sheffield steel trade.

The second point of interest is the limitation of the 33⅓ per cent. to castings, either rough or machined, weighing over 1 cwt. As we have already pointed out, schedule 1 imposes an increased tariff on hollow-ware, baths, stoves, grates, ranges and certain other castings which would fall in the category of rail and tramway construction. The trade may well ask why the limitation in the iron and steel schedule 2 should apply to castings over 1 cwt. We should be inclined to say that the most serious competition came from castings under this figure, particularly in the case of steel castings. It is the large job primarily, that, required singly or in small quantities, is converting our steel foundries into jobbing shops, while the smaller material is being imported. It will be evident that quantities of castings outside the light castings category and weighing under 1 cwt. can come in under the lower rate, and we think this point is deserving of the serious attention of both the iron founding and steel founding sections.

High-Duty Ferrous Alloys.

Austenitic cast iron, nickel cast iron, molybdenum cast iron, and alloyed cast iron constitute relatively new developments in ferrous metallurgy, and their industrial application is being retarded because of the inclusion of the word "*cast iron*" in their make-up. One of the most successful metallurgical novelties in the United States is mechanite *metal*. All the kudos ascribable to the adjectives, *austenitic*, *nickel*, *molybdenum* and *alloyed* is neutralised by the noun "cast iron," because the buyer expects to procure metal entering into this category cheaply. He probably learnt in his youth that good cast iron yielded a tensile strength of 12 tons per sq. in., and seldom remembers that tensile strength has little or nothing in common with the purposes for which he proposed to use the castings. The general run of buyers has at some time or other bought semi-steel as being a material quite different from cast iron, yet entirely novel products, such as we have enumerated, have failed to attract him. A very clear case does exist for eliminating the word "cast iron" for these new products from the iron foundry. We have noted that abroad the electric furnace is being brought more and more into use in the iron foundry, generally as a duplexing plant for super-heating cupola-metal and for adjusting compositional requirements. A certain amount of progress has been made in this country also, but as this slightly more expensive final product still bears the word "cast iron" in its selling classification, it does not always receive the consideration it merits from the buyers. The British Cast Iron Research Association possesses a sub-committee for dealing with alloyed cast iron. Obviously they cannot place such an item as "*commercial nomenclature*" on the agenda, but they could, finishing their academic deliberations, adjourn, reassemble as an amorphous committee, and try and solve this pressing problem of making buyers mentally differentiate between alloyed cast iron and grey iron castings.

To recapitulate: engineers' buyers "fell for" semi-steel because it appeared to be a new material, whilst they are prone to ignore the latest and best iron foundry products, because the word "cast iron" is included in their description. Moreover, to "push" the sales of alloyed cast iron, the salesmen often has to make use of scientific data, instead of putting forward a name, which in itself commands immediate respect, like semi-*steel* or *steel*-alloy. Would high-duty ferrous alloys fill the bill?

XUM

Correspondence.

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

An-Old Established Iron Foundry.

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—We notice in THE FOUNDRY TRADE JOURNAL of April 21, a paragraph relating to "An Old-established Iron Foundry," and are particularly interested to learn that the concern in question—Messrs. Rose, Downs & Thompson, Hull—has been making inquiries and cannot trace any firm with an unbroken family succession older than their own, founded in 1777.

It would appear, therefore, that our firm—Messrs. John White & Son—stands a good chance of holding the record, and you may be interested to have the following particulars:—

This business was established previous to 1715 and has been handed down throughout from father to son. The firm have in their possession a weighbeam (illustrated in their catalogues) discovered at the dismantling of Dunnottar Castle many years ago, which bears, inlaid in brass on one side, the name "John White" and on the other the date "1715." Two others, dated 1779 and 1786, are also in their hands, the former having been in regular use until a few years ago.

The speciality of the firm is the manufacture of weighing apparatus, while in 1922 an iron-foundry was added to ensure an adequate supply of castings suitable for their weighing-machine business and to take up special lines in castings. Of these, one of the most successful has been the mould castings used on automatic bottle-making machines. This has led to a separate department being equipped for the supply of high-standard bottle moulds, completely finished, ready for use on the machines.—Yours, etc.,

JOHN WHITE & SON.

John White & Son
(Partners: Andrew M. White and Edwin R. White),
Auchtermuchty,
Scotland.

May 2, 1932.

Soda Ash and Sulphur Reduction.

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—With reference to the concluding section of Dr.-Ing. Guido Vanzetti's article on "Italian Steel Foundry Practice" on pages 257-9 of your issue of April 28, it is feit that the remarks regarding the reduction of suiphur in converter steel call for some comment.

For some time past, the writers have been working on this problem, and the use of soda ash as a desulphurising reagent has proved to be not only highly successful, but also a means of reducing costs.

It has been our experience that about 20 lbs. of soda ash per ton of metal will remove at least 50 per cent. of the sulphur present in the cast iron. This enables users of the converter process to eliminate the use of specially low sulphur pig and increase the proportion of scrap which they melt in the cupola. This, of course, represents a substantial saving in costs, and the resulting metal is in no way inferior to that produced with the very purest raw materials. Indeed the opinion has been expressed that soda ash definitely improves the final product. (See FOUNDRY TRADE JOURNAL, December 24, 1931, p. 396.)

Dr. Vanzetti is wise in stressing the need for keeping the acid cupola slag away from the soda, but in practice this is not difficult. There is no need, however, to use a neutral-lined ladle. Though soda ash has some slight action on ordinary ganister, or firebrick, this is not sufficient either to prevent the desulphurising action or reduce the life of the lining to any considerable extent.

Of course, the soda slag should never be allowed to get into the converter, where much severer attack would result from the higher temperature. The addition of ground limestone to the slag formed in the ladle will thicken it and ensure its easy removal before the metal is poured into the converter.—Yours, etc.,

(Signed) E. W. COLBECK.
N. L. EVANS.

I.C.I. Research Department,
Winnington,
May 3, 1932.

Forthcoming World Foundry Congress.

PARIS, SEPTEMBER, 1932.

France having been asked to organise the next International Foundry Congress, it will be held in Paris next September. The following programme gives the broad outline of the arrangements so far made:—

Pre-Convention Tours.—From September 8 to 12 two short tours have been arranged:—(1) For those from the Northern countries, the districts of Boulogne, Marquise, Lille and Valenciennes. They will arrive in Paris during the day of September 13, and (2) For visitors arriving by Le Havre, the areas covered by Havre, Rouen and Caen. On September 13 there will be a reception of the visitors by Association Technique de Fonderie in the Arts et Metiers School Hall, 9 bis, Avenue d'Iéna, followed by dancing.

CONGRESS.

Wednesday, September 14. *Opening.*

10 to 12.—Ceremony at the Sorbonne.

12.30.—Luncheon at the Hotel Latetia.

2.30.—Official visit to the Exhibition (Exhibition Park, Porte de Versailles).

5.30.—Reception by Paris Chamber of Commerce.

Thursday, September 15.

9 to 12.—Works visits.

2.30 to 7.30.—Diverse Sessions at the Ecole Nationale d'Arts et Métiers, covering (1) general matters, (2) non-ferrous metallurgy and (3) light alloys.

6 to 10.—Reception at the Hotel de Ville (City Hall).

10.30 to Midnight.—Diner-dansant at the first floor of the Eiffel Tower.

Friday, September 16.

9 to 12.—Works visits.

2.30 to 5.—Diverse Sessions at the Ecole Nationale, covering (*a*) cast iron, (*b*) electric furnaces and (*c*) other subjects.

5.30 to 7.—Joint meeting with the French Institute of Civil Engineers, devoted to the use of various cast alloys.

Saturday, September 17.

9 to 10.30.—Visit the Foundry Exhibition.

10.30 to 12.—Sessions held at the Stands of the Paris Foundry High School and the Association Technique de Fonderie on foundry defects, etc.

2.30 to 4.—Joint Session with the Comité des Forges de France, 7, rue de Madrid.

4.30 to 8.30.—Closing Session. Presentation of Awards.

8.—Closing Banquet at the Palais d'Orsay Hotel.

10.30.—Dancing.

Sunday, September 18.

11.30 to 7.30.—Excursion to Versailles and Rambouillet. Reception by the President of the French Republic.

POST-CONVENTION TOURS.

Monday, September 19.

Two tours have been arranged:—(1) In the Ardennes district (Menzies, Charleville, Revin and Fumay), Luxembourg, Saulnes and Nancy; and (2) the Midlands and Alps, including Rosières and Bourges, then Creusot, Lyons, Ugine, Grenoble and Nice by the famous Routes des Alpes.

Random Shots.

Aston, Smith or James? If we are asked which of these families was the most prolific in providing the foundry industry with "doers," we should have some difficulty in awarding the palm. If such a person exists blessed with the name of James Aston-Smith, his prospects of reaching the top of the iron foundry industry should be particularly bright.

* * *

The latest development in the foundry industry is that of dyeing castings. So far it has only been applied to light alloys, but one never knows! Cravens may in the future announce that their famous s.s.s. lathes are now available in navy blue, stone, grey, beige and saxe, whilst Qualcast advertisements may read—Close at hand is the gardening season, and at the Qualcast showrooms are England's smartest grass cutters. To the very best workmanship, they add definite distinction and personality by the incorporation of the latest colour schemes, designed to blend with the general ensemble of the garden. The new season's manufactures embrace a number of new shades designed to match Italian, Dutch, Old English or Rock Gardens, and so on—*ad nauseam*.

* * *

It has just been announced that London has something like three-quarters of a million telephones—on Press days it seems more. As each one carries about 2 lbs. of iron casting in its base, so that this item has eaten up one day's output of a blast furnace.

* * *

Mr. James T. Mackenzie, of Birmingham, Alabama, U.S.A., who is now in England, relates that one morning he encountered one of his friends, whose face was unrecognisable owing to bandages. On inquiring as to what had happened, he was told that his friend had walked through a plate-glass window the previous night. "What on earth made you do that," asked Mr. Mac. "Well," replied his friend, "it seemed a bright idea last night."

* * *

"Marksmen" has got a new job! He is to technically-direct a film called "Steel" (Mr. Compositor, please hyphenate to avoid a split infinitive). This means, Mr. Cecil Dixon, who at one time provided coke for London foundry consumption, and who is now a big noise with Langham Productions, Limited, has asked us to witness the shooting of the film and to guarantee that the result will not violate the basic technicalities of the steel foundry industry.

* * *

This reminds us that we once enjoyed seeing a film in Paris fashioned after Zola's novel, "L'oeuvre." It had been shot at Le Creusot and Decazeville, and we readily recognised many of our colleagues both at work on the furnaces and roaming around in the streets. Shall we see the Astons, Smiths and James in this coming production of "Steel"?

MARKSMAN.

Fire-Grate Bottoms are "Light" Castings.

Rates Tribunal's Decision.

The Railway Rates Tribunal, in a reserved judgment on May 5, held that the modern type of fire-grate bottom, which is of cast iron, supported on feet, and which, while of the grid-iron type, is sightly cupped so as to form, with a "fret," sides and back, the fire receptacle, was a casting of "light" type within the meaning of the existing railway classification list.

The contention of the Associated Builders' Merchants, Limited, was that the fire bottoms were of the "heavy" type of casting and as such were entitled to be conveyed at lower carriage charges than the "light" type.

Materials Handling in the Small Brass Foundry.*

By D. G. Anderson and B. F. McAuley.

One of the recent trends in foundry practice, as in numerous other industries, has been the development of equipment to speed up production by improvements in materials-handling methods. There are few foundries exactly alike, yet there are a great many foundries which are faced with the problem of installing improved equipment to reduce costs and meet present-day competition.

However, the foundryman planning to improve his plant may find it difficult to decide upon what sort of equipment and lay-out will serve him best. This is because the improved equipment must be correctly applied to the local conditions existing in each particular foundry.

The brass foundry at the Hawthorne Works of the Western Electric Company is devoted to the production of non-ferrous castings that are required in the manufacture of telephone equipment. It occupies an area of 75 ft. by 125 ft. in a wing of the main foundry, and its normal capacity has been doubled within recent years by the introduction of new equipment. The majority of the individual castings made in it are small and of a wide variety of design. Accordingly, it can be considered in the small or jobbing foundry class. While such a small

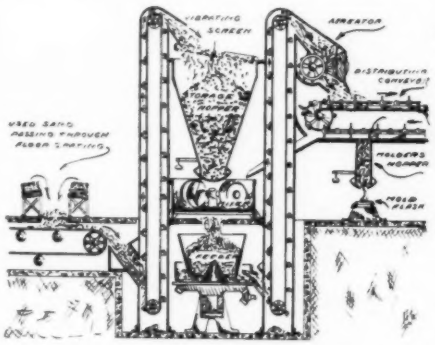


FIG. 1.—METHOD USED FOR HANDLING MOULDING SAND.

foundry does not lend itself as readily to mechanical handling as do larger foundries which are laid out on a basis of heavy production schedules, it has been found that the introduction of more efficient equipment with the improved sequence of operations described below has been justifiable.

Foundry Equipment and Procedure.

Fig. 1 shows a diagrammatic section of the sand-conditioning unit. The shakeout sand is dumped through protected openings in the floor on to an 18-in. rubber-covered conveyor belt which carries the sand to the boot of an enclosed elevator. The returned sand is carried upward by a standard bucket elevator with buckets mounted on a rubber-covered belt, and discharged on to a vibrating screen. The screen cloth has a diagonal mesh of ¼ in. by 1 in. which permits the sand to flow through it into a storage hopper. Any cores and bits of metal are discharged over the screen into a container on the floor.

Control of Sand.

From a measuring hopper of 10 cub. ft. capacity, located at the bottom of the storage hopper, the used sand is discharged into a mulling type of sand mixer. Here both water and new sand are added in order to bring the sand up to its proper consistency for moulding. Water is added by means of a gravity flow from a small measuring tank. It enters the mixer from six nozzle openings located around the edge of the machine. The relative moisture is determined by an electrical resistance moisture-meter installed on the mixer. This instrument has proved to be very valuable in maintaining a uniform moisture in the sand.

After a mixing of approximately 3 min., the prepared sand is discharged on a table-feeder located in a pit under the mixer. The table-feeder has a raised conical section at the centre. This tends to throw the sand against a fixed retaining plate around the circumference of the table as the latter rotates.

There is an opening between the table feeder and the housing through which a plough is inserted to scrape sand off the rotating table. The rate at which sand is discharged from the table-feeder is regulated by the setting of the plough.

This feature permits continuous feed from the table as the plough deflects the sand to a bucket elevator from which it is discharged into an aerator. In passing through the aerator, the sand is thrown at high velocity through a series of wire brushes that break up any small lumps which may be present. The sand is light and fluffy when discharged from the aerator to the flight conveyor.

Conveying Conditioned Sand.

The aerated and conditioned sand is conveyed to the moulding positions by a double-deck drag conveyor 15 in. wide and 7 in. deep, with flights spaced on 18-in. centres. The flights are carried on a roller chain that runs on light rails. At the operating speed of 90 ft. per min., the capacity of the conveyor is 25 tons of prepared sand per hr. The flights travel in built-up rectangular troughs open at the top. Sand from the aerator is carried in the upper trough to the far end of the conveyor, where it is dumped over the take-up end into the lower trough. The moulders' hoppers are filled automatically as the flights in the lower trough pass over openings leading to them. Three of the flights are fitted with rubber tips in order to keep the conveyor free of any sand that may accumulate and coagulate.

The moulders' hoppers are circular, with a diameter of 14 in. at the top and 16 in. at the gate. This prevents the sand from sticking in the hoppers and ensures a positive flow whenever the discharge gate is open. Deflectors are mounted beneath the gate to direct the falling sand into the centre of the flask on the moulding machine below. The entire construction of the hopper eliminates waste time due to clogging sand and unnecessary spillage.

Mould-Conveying Problems.

The completed moulds are placed on roller conveyors of the lateral-slope type. Unprotected moulds made in snap flasks are used exclusively. Ordinarily, moulds are contained in flasks when moved on a roller conveyor, but experiments proved that unprotected moulds could be conveyed successfully by employing protecting contacts, that is, cleats on the bottom board which protect approximately ½ in., making a separation of 1 in. between moulds. The flask sizes are selected to produce the maximum number of good castings per day. This usually is not the largest flask or the pattern design that produces the greatest number of castings in one mould. Large flasks cause fatigue, and small patterns grouped close together frequently cause the separating sand walls to fracture when the pattern is withdrawn.

Experience has shown that the largest mould which can be used economically is 10 in. by 18 in. with 4-in. cope and drag. Furthermore, the most satisfactory mould size, from the standpoint of convenience of handling, is 10 in. by 14 in., with up to 4-in. cope and drag.

Inspection and Maintenance.

The complete sand-preparation and sand-handling unit is so constructed that it can be easily inspected and maintained. All the overhead equipment is readily accessible from a gangway that extends the length of the conveyor. The underground equipment has lighted gangways along its entire length. This not only facilitates repairs, but enables the pits to be kept clean. Moving units are equipped with individual drives and, except for a belt-drive on the vibrating screen and a direct motor-drive on the aerator, herringbone-gear speed reducers are used. All moving parts are equipped with grease fittings, and the bearings are protected from sand and dust. The sand-handling equipment is controlled from a push-button control panel with pilot lights for each unit. All units of the prepared-sand and shakeout-sand systems are electrically interlocked so that no material may be conveyed until all units are in operation. This prevents sand from piling up at any point should one unit stop.

Sand Control.

Since the functioning of the above-described unit depends on the uniformity of moulding sand, it was necessary to introduce a control on the consistency of the sand. Accordingly, sand-testing laboratory was set up having equipment conforming to standard or tentative methods of test of the American Foundrymen's Association. Inasmuch as uniform mixing is necessary to produce uniform results, a limit was set on the mixing time. It was found that the desired results were obtained if water was added ½ min. after the sand had been charged into the mixer and if the sand was discharged 2 min. after the mixer had been charged. At no time is the sand allowed to remain for a longer period than 4 min. In order to replenish losses, new sand additions are made at intervals of not less than ½ hr. Each of these charges is introduced through the openings of the shakeout system, and consists of not more than 200 lbs. By using this procedure the new sand is distributed uniformly in the storage bin and, hence, throughout the system.

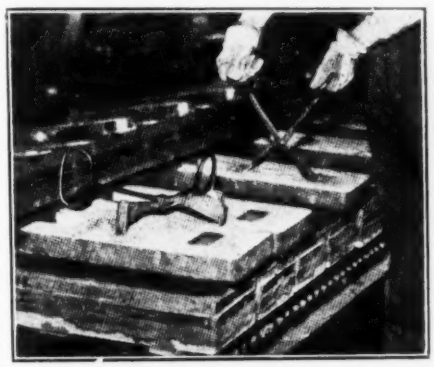


FIG. 2.—TONG METHOD FOR HANDLING WARM WEIGHTS.

A control of the consistency of the sand has proved of great advantage in controlling the quality of product. The results of it have manifested themselves in a reduction of scrap due to holes, warped castings, "drops," "blows" and "washes." The uniform sand has enabled the moulder to regulate his machine-moulding practice and to use the same moulding pressure day after day for a given job. The pourer also depends upon the moisture content being uniform in determining the temperature for the metal and the chill effect within the mould.

* A Paper read before the Detroit Meeting of the American Foundrymen's Association. The authors are on the staff of the Western Electric Company.

Melting and Pouring Equipment and Procedure.

Electric rocking arc furnaces having an output of 1,400 lbs. per hr. are used for melting the various brass alloys. With these furnaces it is possible to use considerable quantities of scrap punchings and baled copper wire in the charges. Since the atmosphere is kept free of oxygen by the burning carbons, no difficulty is experienced in regulating the mix or controlling the melt.

The complete melting equipment occupies an area of 720 sq. ft., all of which is located under a hood from which the hot gases and fumes are removed by an exhaust system. The quantity of air removed in this manner has a beneficial effect on the whole foundry, in that the positive circulation of air greatly reduces the quantity of dust particles in the atmosphere. Cast-iron plates, covered with carborundum and flush with the concrete floor, are placed between the pedestals and in front of each furnace. These plates protect the floor from spilled metal and provide good footing for the operator. A small sheet-metal deflector that can be easily removed is mounted over the furnace opening to disburse glare as much as possible.

The crucibles of molten metal are conveyed from the furnace on a small dolly truck, which eliminates the hazard of spilled metal. The dolly fits between the furnace pedestals, and when the crucible has been filled the dolly is moved clear of the furnace. The crucible with the pouring device then is picked up on a monorail system serving the mould storage floor, each bay of which is equipped with a travelling monorail that provides accessibility to each of the pouring racks in it.

The pouring of moulds is handled by experienced men, while the moulders remain at their machines. Alternate moulds on the storage lines are poured, after which the mould weights are placed on the adjacent moulds and the remainder poured. The transfer of the hot mould weights is made with tongs that fit into recesses in the top of the plates, as shown in Fig. 2. The use of such tongs greatly reduces the hazards of the manual handling operation.

Cleaning Equipment and Procedure.

Sandblasting is used for cleaning the castings because the cutting action of the sand stream removes all scale from the surfaces exposed to the direct action of the blast. Small castings are cleaned in two sandblast barrels consisting of a rotating cylinder which contains the parts and tumbles them in the path of the sand stream. A 200-lb. charge of medium-size castings is thoroughly cleaned in 10 min., or in one-third the time required with water tumbling barrels. Large castings are cleaned rapidly and without dust in a sandblast cabinet.

Conclusions.

The studies and changes effected have demonstrated that production methods can be applied economically in a jobbing foundry. The important developments brought out in the Western Electric Company installation are as follow: (1) That one grade of moulding sand can be used for the production of a varied line of non-ferrous castings. A uniform grade of moulding sand makes practical the use of a single sand-handling unit; (2) that unjacketed moulds can be safely moved on roller conveyors into position for pouring; (3) that metal of high quality can be produced in an electric arc furnace from a melting stock compounded of scrap materials, and (4) that small lots of castings can be cleaned rapidly in tumbling barrels of special design.

Art in Publicity.—We recently reviewed an etching entitled "Cupolas," which has been published by the Grangemouth Iron Company of Falkirk. Our criticism was evidently in agreement with the experts as it has been hung in the Royal Academy, Edinburgh.

The Copper Situation.

By "Onlooker."

After weeks of sagging markets, with electrolytic copper offered as low as 5¼ cents by second-hands in the States and standard copper in London down to a gold parity of about £23, there has been a change for the better, and some attempt on the part of the Americans to raise values. This has not met with a great deal of success, and standard values have been rather reactionary, for consumers seem shy of booking above 6 cents and have somewhat cold-shouldered offers at 6¼ cents. This lack of confidence in the red metal is the most unsatisfactory aspect of the situation, but it is difficult to see how this is to be overcome until it is known what is to be done about the huge stocks in existence at various producing points in different parts of the world. It is, of course, known that the banks in the States have advanced money on these stocks, and with the market falling so disastrously, it is reasonable to assume that their position is not a very happy one; nor can the producers, with additional cover to find with every decline in the price, be feeling very pleased with the situation.

Although the presence of these very onerous reserves is a decidedly depressing factor, the entry of the banks on the scene as stockholders has been all to the good, for naturally they are keenly interested in keeping up the price, and there can be little doubt that selling policy in copper has to a great extent been dictated by the banking community. Possibly they may be backing the agitation for a tariff on foreign copper entering the States, for introduction of this would immediately raise values and improve the value of the security they hold. This agitation for a tax on copper has been blowing hot and cold for months, and not so long ago it was said that the scheme could not possibly go through, but it has cropped up again, and it now looks as if something may come of it.

U.S.A. Tariff Prospects.

The effect of a tariff on copper entering the States would be to shut out the low cost production from Canada and Chile, and since fresh markets must be found for this metal, business in Europe would become very competitive, and prices would rule very much lower than in the States. Probably also surplus production from America would be dumped in this country at cut-throat prices. It is, of course, a more or less open secret that the Canadians were most anxious that copper should go on the free list, for had we put a tariff on the red metal here, America would have been encouraged to follow suit.

A break-up of Copper Exporters seems at present a somewhat remote contingency, although recently a rumour about the withdrawal of Katanga caused a short-lived flutter in the market. At this juncture, when the future of the price is in the balance, everyone hopes that the producers will hang together and continue to keep production down to the agreed 20 per cent. of capacity. If only some improvement in the statistical position could be achieved, we should speedily see the beginning of an upward movement, for the ruling price is certainly below the average cost of production, and it is, in fact, doubtful whether any mine can show a profit to-day, more particularly as output is running at only 20 per cent. of capacity.

The London standard market, which is still to a great extent the barometer of the copper trade, seems to come in for a good deal of support when the price goes below £30, and it may be taken for granted that at these low levels bears are not at all keen on selling short. Any fall, therefore, is likely to be short-lived, and a serious collapse is almost unthinkable. On the whole, it looks as if we shall see fluctuations on this side dictated by the day-to-day reports of world developments which are at present affecting all stock and commodity prices, a further factor making for instability being the movement of the £ *vis-à-vis* the dollar. Buyers putting copper on their books at about 6 cents or just below that figure should not have any cause to regret their purchases.

Book Review.

Chromium Plating, by Edward S. Richards. Published by Charles Griffin & Company, Limited, 42, Drury Lane, London. W.C.2. Price 7s. 6d.

Though but six years old, chromium plating has established for itself a permanent place as a medium for inhibiting corrosion of engineering components and domestic articles. The author very quickly details the applications of chromium plating, but does not give any information as to whether he has encountered difficulties peculiar to any type of base material to be plated. We have heard it stated that white-heart malleable is preferable to black heart for plating purposes, and information of this character could be usefully incorporated. Apart from this small defect the book is an excellent practical treatise on the subject. Readers may receive an impression from the illustrations that there is only one firm in Great Britain which supply equipment for the chromium-plating industry. Actually, there are about half-a-dozen, but the one whose products have been used as illustrations is probably the largest and important manufacturer. Study of the book quickly removes any impression that it is a compilation from manufacturers' catalogues. Actually, Mr. Richards has consistently drawn upon his personal experience and those of his colleagues, especially foreign ones. The book has 131 pages divided into well-chosen 12 chapters; contains 70 illustrations and is adequately indexed. We heartily commend this book as being a thoroughly reliable and practical text-book for those engaged in this new industry.

Industry and the Empire.

THE OTTAWA CONFERENCE.

A committee of the Federation of British Industries, under the chairmanship of Sir Hugo Hirst, has drawn up a report in connection with the forthcoming Empire Economic Conference at Ottawa. In February, 1930, and again in March, 1931, the Federation publicly stated its views as to the necessity for increasing inter-Imperial trade, and in this document it stresses—even more emphatically—the paramount need for a policy of Empire economic co-operation broadly conceived and actively prosecuted. Having stated the reasons for this necessity, the authors of the report examine in detail the questions of Empire tariffs, complementary industrial production within the Empire, an Imperial investment and monetary policy, close and constant economic consultation within the Empire, and the potentialities of the Crown Colonies.

Mr. J. H. Thomas, Secretary for the Dominions, stated in the House of Commons recently, that in addition to official advisers from the Departments of State, it was proposed to include in the United Kingdom delegation to the Ottawa Conference seven advisers, as follow:—For industrial and commercial questions: Sir Gilbert Vyle, Lord Weir, Sir Alan Anderson (these three having been nominated by the British Committee on Empire Trade and thus being representative of the Association of British Chambers of Commerce, the Federation of British Industries, and the Chamber of Shipping of the United Kingdom); Mr. J. Bromley and Mr. Walter Citrine (nominated by the General Council of the Trades Union Congress). As adviser on Colonial trade matters: Sir Edward Davson. An adviser for agricultural questions would also be included.

Foundry Trades' Equipment and Supplies Association.

SIXTH ANNUAL MEETING.

The sixth annual general meeting of the Foundry Trades' Equipment and Supplies Association was held at the Northumberland Rooms, Northumberland Avenue, London, W.C.2, last Thursday, Mr. D. Howard Wood presided over a luncheon held prior to the meeting. The annual report and balance-sheet were submitted and approved. An extract of the report is given below.

Annual Report.

The number of members on the rolls at the close of the year under review is 35, being the same as at the corresponding date in the previous year, and although this does not show any increase it is felt to be, up to a point, satisfactory, having regard to prevailing conditions. In view of these, however, one or two resignations may reasonably be anticipated, and it is, therefore, extremely important that unremitting efforts be made to recruit new members. By far the most effective method of accomplishing this is by personal representations of existing members to possible candidates, and all are, therefore, invited to bear this great need in mind whenever the opportunity should arise.

On the financial side, the aim of the Association in normal times is to balance as nearly as possible the income and expenditure, although a slight excess of the latter over the former is to be anticipated in some of the years between Exhibitions. It is recognised that no substantial profit can be made with our present membership at the low fees charged. The adverse balance shown in this year's accounts will be seen to be mainly accounted for by the loss on the production of the hand-book; this was clearly foreseen at the time it was undertaken, and it was felt that the service to the Association and its members would well warrant the expenditure involved. In the opinion of the Council, the Association's resources remain adequate for its work during the period that must elapse before the coffers are replenished as a result of the next Exhibition.

The chief positive function of the Association during the year 1931 has been the issue of the second edition of the hand-book, as it was felt that it was time that the original edition was brought up to date and that an additional reminder was issued to all interested parties of the existence and activities of the Association. It is a matter of congratulation that it was found possible to issue 6,000 copies of this edition, compared with 5,000 copies of the first edition, and that the cost to the Association was £18 1s. 6d., compared with £22 1s. 6d. on the previous occasion. These copies have been disposed of as to approximately 5,000 to foundrymen in the United Kingdom, 500 to those overseas and the balance to members and to stock for casual purposes. A special reminder was issued with each copy sent overseas, drawing attention to the services we are prepared to offer under Clause (f) of the Aims and Objects stated in the book.

Exhibition Policy.

Reference was made in the last Annual Report to the arrangements for the next Exhibition, but as the actual resolution determining these was passed at an Extraordinary General Meeting held on February 5, 1931, it is quite in order here to remind members that the Exhibition will take place at the Royal Agricultural Hall, London, from April 24 to May 3, 1933. We are exceedingly gratified to rejoice in the official assurance of the Institute of British Foundrymen that their unstinted support will again be forthcoming, although it has not been possible on this occasion to arrange for the Exhibition to coincide with their Annual Convention. The Council will commence activities on the Exhibition immediately after the Annual General Meeting in 1932.

Whilst on the subject of exhibitions, it may be as well to state once again that one of the main items in the Association's programme and, in fact, one of the main objects for its existence, is the regulation of exhibition policy, both in this country and on the Continent of Europe, both in relation to congresses and conventions and independently of them. It will remain the Council's constant endeavour to procure that the best interests of the majority of members and of the trade as a whole should be served in this matter. It is hoped that the policy of the past has so far achieved this object.

Financial Support for Conventions.

The question of the best method of the Association's rendering financial support to the Annual Convention of the Institute of British Foundrymen has received attention for the last few years, and on the occasion of the Convention in Birmingham in June, 1931, a method was adopted whereby members of the Association were invited to contribute to a fund raised by the Association, the whole of which sum was then handed over to the Institute as the combined subscription of our members, and the names of the contributors were then published in THE FOUNDRY TRADE JOURNAL. The sum raised on this occasion was £85 12s. It will be remembered that by this method contributing members are not expected to subscribe individually to the fund, and the Institute Officials on this occasion co-operated wholeheartedly in the scheme. This method is to be contrasted with that obtaining in the previous year in connection with the Middlesbrough Convention, when members were left to make individual contributions to the convention funds, and the Council will consider from time to time what method can most advantageously be adopted in respect of each occasion as it arises.

Negotiations with the B.C.I.R.A.

An opportunity has arisen during this year of entering into communication, both by personal meeting and correspondence, with the British Cast Iron Research Association regarding the methods of marketing of any patents or processes which that Association shall evolve in the course of its normal work, and it has been deemed by us very important that the relations in this particular between the British Cast Iron Research Association and the manufacturing and distributing sides of the industry in general and with this Association in particular should be defined so that all ambiguity or possible misunderstanding shall be avoided. As a result, the British Cast Iron Research Association have graciously consented to state a policy in a resolution, copies of which have been forwarded to all our members, and it is our great hope and wish that under this policy the greatest success shall crown the efforts of the Research Association in furthering the interests of the entire foundry trade to the benefit of consumer and supplier alike.

We are given to understand that the list of foundries to be included in the new edition of Ryland's Directory, under the scheme agreed between the proprietors of that publication and ourselves, will be ready for issue before the printing of this report. We would wish to take this opportunity once again of thanking Messrs. Industrial Newspapers, Limited, proprietors of both the Directory and our Official Organ, THE FOUNDRY TRADE JOURNAL, for the unfailing support which they give us in this and other directions.

In order to bring our members more closely in touch with our activities than is possible at General Meetings only, a précis of the proceedings of each Council Meeting is prepared and supplied to every member. The Council would stress their great anxiety to give their fullest consideration to any question of general policy which any member at any time may care to bring forward. It will usually be possible for any such member to attend a Council meeting in person to explain his point should he so desire, and any suggestions, whencesoever forthcoming, for the increased usefulness of the Association to the members it serves will be more than welcome.

The Report is signed by Mr. D. H. Wood (President) and Mr. K. W. Bridges (Hon. Secretary), March, 1932.

Election of Officers.

At the first meeting of the Council, which followed the luncheon, Mr. Wood was re-elected President and chairman of the Council for the ensuing year, Mr. H. G. Sommerfield was re-elected Vice-President, and Mr. G. C. Castle was elected a Vice-President.

The Iron and Steel Institute Dinner.

Probably, on account of the fact that there were more Papers germane to foundry practice, there was a larger attendance of people prominent in the foundry industry than usual at the Annual Dinner of the Iron and Steel Institute. It was presided over by Sir Charles Wright, and the principal speakers were Field-Marshal Sir George Milne, General the Hon. Sir Herbert A. Lawrence, the Right Hon. John Hodge, P.C., Sir John Cadman and Sir Harold Carpenter, F.R.S.

The Institute of British Foundrymen was officially represented by its President, Mr. Andrew Harley; whilst two Past-Presidents, Mr. Vincent C. Faulkner and Mr. J. T. Goodwin, were also present. Prominent amongst foundry proprietors and directors and metallurgists were Sir Robert Hadfield, Sir Hugo Hirst, Mr. A. J. Grant, Mr. E. J. Fox (Stanton), Col. Appleyard (Birtley), Mr. H. E. Cookson (Ackrills), Mr. F. C. Fairholme (Firths), Mr. H. B. Toy and Mr. S. V. Toy (British Chilled Roll), Mr. F. W. Stokes (Sheepbridge Stokes Centrifugal Casting Company), Mr. W. Turner McLellan (Bengal Iron Company), Major H. H. Jackson (Clay Cross), Mr. Ambrose Firth and Mr. T. Firth (Brightside Foundry), Dr. A. McCance (Colvilles), Mr. J. S. Kerr (Partington), Mr. A. Pye-Smith (Osbornes), Mr. A. N. McQuestan (Cochranes), Mr. J. T. McKenzie (American Cast Iron Pipe Company), Mr. G. Montfort (Schneider et Cie), Mr. David Rushworth (Clay Cross), Mr. J. E. Hurst (Sheepbridge Stokes), Mr. C. H. Kain (Lake & Elliott), Mr. A. Allison (Habershon) and Mr. H. Shillitoe (Glanmor Foundry). Others present who are closely associated with the foundry industry were Sir Henry Fowler (President of the Institute of Metals), Sir William Larke, Prof. J. H. Andrew (Sheffield University), Dr. C. H. Desch (N.P.L.), Dr. W. H. Hatfield (Firth-Brown Laboratory), Mr. J. H. S. Dickenson (River Don Works), Col. W. F. Cheesewright, Mr. H. Jeans (chairman, Industrial Newspapers), Mr. Barrington Hooper (managing director, THE FOUNDRY TRADE JOURNAL), Mr. J. Fallon (Incandescent Heat Company), Mr. D. F. Campbell and Mr. W. S. Gifford (Electric Furnace Company), Mr. W. T. Griffiths (Mond Nickel Company), Dr. R. Hay (Glasgow), Mr. G. T. Lunt (Bradley & Fosters), Mr. N. D. Ridsdale, Prof. Turner, Mr. T. Henry Turner (chief chemist, L.N.E.R.), Mr. S. Grayson (British Consul at Pittsburg), and Mr. A. C. Turner (General Refractories).

A Year of Progress.

ANNUAL MEETING OF BIRMINGHAM BRANCH OF THE INSTITUTE OF BRITISH FOUNDRYMEN.

The annual meeting of the Birmingham, Coventry and West Midlands Branch of the Institute of British Foundrymen was held on May 2 at the Imperial Hotel, Birmingham, Mr. F. J. Hemming (retiring Branch-President) in the chair at the opening of the proceedings.

A Good Report.

Mr. F. K. Neath (hon. secretary and treasurer) presented the annual report, which referred to the session 1931-32 as being one of greatest importance to the Branch. The Report stated that immediately following the last annual meeting the Branch was privileged to be host to the annual conference, which visited Birmingham and Coventry, and to have one of the members of the Branch elected as President of the Institute. The fact that the conference has been admitted to be the most successful yet held is in itself proof of the manner in which the members of the Branch endorsed the Institute's choice of President and the Council is greatly indebted to all members and to the industry and civic authorities for their splendid support, without which the conference would not have been carried through. The financial side of the conference was satisfactory in spite of the difficult times and thanks are due to all subscribers to the conference fund. Since the conference the Branch has had a very successful session. The number of meetings held has been 7, with an average attendance of 35. Two of these meetings had been held in Coventry. Five Branch Council meetings had been held to an average attendance of 12. The present shortage of work in the foundry industry has made the arranging of works visits a difficult matter and the Branch Council has decided to defer any such visits until more favourable conditions prevail. It is gratifying, however, to see that in a recent editorial review of the programmes of the various branches by The Foundry Trade Journal the palm was awarded to the Birmingham, Coventry and West Midlands Branch for the variety and suitability of the various lectures. The annual dinner held in February was very successful and the experiment tried two years ago of inviting the ladies to this function now appears to have become a permanent feature. The present membership of the Branch is 228. During the year 33 new members have been elected and 17 have resigned, or have been transferred to other branches. The Council regrets to record the death during the year of Mr. J. E. H. Allbut, a former general secretary. In January last the General Council conferred the privilege of Honorary Life Membership on Mr. F. J. Cook, who is one of the founders of the Institute, a Past-President and the oldest member of the Branch. In conclusion Mr. Neath tendered his resignation as the honorary secretary, after six years' service in that office. He thanked all the members who had supported the activities of the Branch during that period for their kind help and continued assistance and he assured his successor that among the members of the Branch he would make many very good friends. Mr. Neath added that the accounts showed a favourable balance of £87 5s. 7d., an increase of £27 on the previous year.

The report and accounts were approved.

The New Officers.

On the proposition of the chairman, seconded by Mr. D. H. Wood, Mr. J. G. Pearce, M.Sc., was elected Branch-President. In taking the chair, Mr. Pearce expressed a hope that the Branch would have a bumper session next winter.

Mr. E. J. Lewis was elected Senior Vice-President and Mr. G. T. Lunt, Junior Vice-President.

Mr. L. W. Bolton was appointed hon. secretary and treasurer, in succession to Mr. F. K. Neath, who is leaving Birmingham for Keighley, Yorks. Mr. F. J. Hemming said Mr. Bolton had been Mr. Neath's right-hand man, and was also under the wing of the President. Mr. Bolton promised to do his best to follow in Mr. Neath's footsteps.

Three vacancies on the Council were filled by the election of Messrs. G. Moran, F. W. Lloyd and H. C. Heggie.

Four representatives to the General Council were appointed, as follow:—Messrs. J. B. Johnson, H. J. Roe, W. J. Flavell and E. J. Lewis.

The President and Mr. Hemming were asked, and consented, to serve on the Technical Committee established by the General Council, in succession to Mr. Neath and Mr. D. Wilkinson.

The Question of Co-ordination.

The President said that, as members were aware, a few years ago there was a certain falling-off in membership of some of the metallurgical societies of the district. In addition to the local Branch of the I.B.F., there were in the district the Birmingham Metallurgical Society, the South Staffordshire Iron and Steel Institute, and the Institute of Metals, which had a flourishing Midlands Branch. The three last-named societies endeavoured to overcome a certain measure of overlapping by forming a Co-ordinating Committee of Technical Societies, and for the last three or four years had arranged a joint programme. He understood that each organisation covered its affairs exactly as formerly, but the establishment of the Co-ordinating Committee enabled members of any of the bodies to attend the meetings of the others. The local branch of the I.B.F. was proposing to co-operate with the other societies named during the next session to the extent that they would arrange their programme so that their lectures were given on evenings which did not clash with meetings of the other bodies. Mr. Bamford, of Wednesbury, the Principal of the County Technical College, and this year chairman of the Midlands Branch of the Institute of Metals, had suggested that the Birmingham, Coventry and West Midlands Branch of the I.B.F. might like to come into closer contact with the Co-ordinating Committee. This Committee started about ten years ago. It was felt at the time by many members that, as each society represented a distinct branch of metallurgy, it was scarcely possible for co-ordination to be successful, but Mr. Bamford pointed out that experience had shown that under co-ordination each society had not only been able to preserve its individuality intact, but had actually increased its membership. Obviously, the Branch could not give any definite reply at the moment to a proposal which had only just come to hand, and it was a matter for the Council to consider. But it would assist the Council in their deliberations and in answering Mr. Bamford's letter if members would express their views on the subject.

Mr. R. L. Bethell, President of the South Staffordshire Iron and Steel Institute, mentioned that at a meeting of the Co-ordinating Committee on the previous Friday it was decided to draw up their programme forthwith and pass on the days arranged to the Council of the I.B.F. They had felt for some time that it would be a good thing if the meetings could be arranged so that they did not clash. During the past session several meetings had clashed. They thought that such an arrangement would be the first step towards co-ordination. With regard to expense, each society contributed a fixed amount per annum, which was assessed by the Co-ordinating Committee according to the expense expected. It was not a big sum—he thought about £20. If four societies co-operated instead of three, expense would be even less.

Mr. F. J. Cook recalled that a similar proposal had been vetoed in the past on the ground that the Branch had no power to hand over part of its income to a body which was not under the control of the General Council. That difficulty, however, might be overcome.

In reply to a question, Mr. Bethell explained that the lump sum covered such matters as cost of rooms, sending out notices and programmes, secretarial expenses and so on.

The President said he did not suggest any resolution at this stage. The opinions expressed would be of great assistance to the Council in dealing with the matter. It might be that no action would be taken until the annual meeting in twelve months' time.

Recognition of Services of Mr. F. K. Neath.

Mr. F. J. Hemming said that when, some few weeks ago, they received the resignation of Mr. F. K. Neath, after serving them for six years as secretary, he was convinced that the members of the Branch would wish to make Mr. Neath a presentation of some sort to remind him of his association with the Branch and of the fact that the members were intensely grateful for his work for the Branch. During the past six strenuous years Mr. Neath had interested himself in all the activities of the Branch, both small and great, and had become the friend of all of them. Mr. Neath had been most unselfish and possessed a winning personality. He had great pleasure in handing to Mr. Neath a wallet containing a cheque, and they also asked him to accept a wireless set to mark their regard for him and appreciation of his services.

Returning thanks for the gifts, Mr. Neath said he needed nothing solid to keep him perpetually in mind of the Birmingham Branch and all its members. Nevertheless, it was pleasant to have something tangible and useful in these modern days.

The Chairman said they would all join in wishing Mr. Neath every success in the new sphere of activity to which he had been called.

It was decided to send a message to Mr. W. J. Flavell, who has been ill, expressing the hope that he would soon be fully recovered.

On the motion of Mr. F. J. Cook, seconded by Mr. Bethell, a hearty vote of thanks was accorded to the members of the Council and officers for their services during the year.

The President said members would have noticed with regret the passing of Mr. Charles Retallack, one of the grand old men of the foundry trade of the Midlands. A vote of condolence was passed with the family.

Import Duties Advisory Committee.—The Import Duties Advisory Committee announce that applications, whether in relation to additional duties or to the Free List, should be made, so far as possible, by representative bodies of the trades concerned. The Committee do not propose to proceed as a rule by formal hearings. Applicants, therefore, should submit their case fully in writing and the Committee will call for such supplementary statements, oral or written, as may be required. The Committee will from time to time give notice of cases in which they are considering the question of the imposition or modification of "additional" duties, or of variations of the Free List, in order that interested parties may have the opportunity of making representations.

The Iron and Steel Institute.

ANNUAL MEETING IN LONDON.

The Annual Meeting of the Iron and Steel Institute was opened last Thursday at the Institution of Civil Engineers, Great George Street, Westminster, Col. Sir W. Charles Wright, Bt., K.B.E., C.B. (President), in the chair.

Report of Council.

The Council of the Institute in their report for 1931 state that during the past year 101 new members and eighteen associates were elected; 4 associates were transferred to membership, and 5 members were reinstated. Sixty-eight members resigned their membership during the year, and the names of 37 members were removed from the register owing to the non-payment of their subscriptions. The total membership of the Institute on the register on December 31, 1931, was accordingly as follows: Patron, 1; honorary members, 7; life members, 75; ordinary members, 1,876; associates, 38, making a total of 1,997. The deaths of 26 members occurred during the year.

The Council specially wish to put on record their sense of the great loss sustained by the Institute by the death of Sir Hugh Bell, Bt. Sir Hugh was the last but one of the original members of the Institute, and had served on the Council since 1905. Two years later the Council elected him President of the Institute, that is to say, long before the period at which he would ordinarily have attained to the office of Vice-President. It was under his Presidency that the notable meeting of the Institute at Vienna took place in 1907. He was the principal organiser of the Collective Exhibit of British Pig Irons, formed under the auspices of the Institute, at the Franco-British Exhibition of 1908. His period of office as President lasted three years. In 1921 he again took the lead as acting President at the Paris Meeting, when Dr. Stead, President for the time being, found himself, for reasons of health, unable to attend. It may be recalled that Sir Hugh, as a gift to the Institute, during his Presidency secured from the Royal College of Heralds the grant of the Armorial Bearings since borne by the Institute. There were many other occasions on which Sir Hugh Bell, either by personal effort or by the exercise of his powerful influence and advice, rendered assistance to the Institute.

Sir Arthur Dorman, who was elected a member in 1874, pre-deceased his life-long colleague, Sir Hugh Bell, by a few months, so that in one year the industry lost two of its principal leaders. The Council has also had to record, with deep regret, the death of Mr. W. Simons (Vice-President). Mr. Simons had served on the Council since 1924, and his loss in the midst of his active career is greatly felt by all his colleagues.

The Council has also had to record with deep regret the death of the Honourable Sir Charles A. Parsons, O.M., K.C.B., F.R.S., Bessemer Medallist of the Institute, who died on February 11, 1931. Sir Charles Parsons was not a member, but in recognition of his great services in the advancement of engineering science as applied in the manufacture of iron and steel, the Bessemer gold medal was awarded to him in 1929.

The income for the year under review, apart from that of the Carnegie Scholarship Fund and of the Special Purposes Fund, was £7,985, and the expenditure was £7,891.

Andrew Carnegie Research Scholarships.—On the recommendation of the Carnegie Research Committee, grants were made by the Council to the following candidates:—

L. W. Bolton (British Cast Iron Research Association, Birmingham), £100, in aid of a research on the transverse strength of cast iron at elevated temperatures.

COLONEL SIR W. CHARLES WRIGHT, BT., K.B.E., C.B.
(President of the Iron and Steel Institute).

E. L. Francis (University of Manchester), £100, in aid of the continuation of his present research on the wire-drawing process.

C. E. Homer (University of Birmingham), £100, to carry out an investigation on the influence of inclusions on the corrosion of steels of various types; the research to be undertaken on behalf of the Corrosion Committee.

Brynmor Jones (University College of Cardiff), £50, in aid of an investigation on the nitrogen hardening of steels.

W. Kleinefenn (Technical High School, Aachen), £50, to carry out an investigation on the metallurgical conditions of welds.

Tibor Vér (University of Technical Science, Budapest), £50, to study the influence of repeated stress on welded iron and steel.

J. Vietorisz (University of Technical Science, Budapest), £100, to continue his research on the malleability of rolled soft iron and methods of its improvement.

J. L. Miller (Harvard University, Cambridge, Mass., U.S.A.), £100, to study the corrosion resistance of alloys of steel with copper, silicon, nickel and molybdenum.

Corrosion Committee.—This Committee has produced and distributed its First Report. A series of field tests was inaugurated at the end of 1930, and such tests have now been in progress for upwards of twelve months at Llanwrtyd Wells, Woolwich Arsenal, Redcar, Motherwell, Sheffield, Calshot, and in the Dove Holes Tunnel of the L.M.S. Railway. Stations abroad have been established at Basrah, Khartoum, Singapore and Durban, all within the British Empire, and at one foreign station, namely, Abisko, in the North of Sweden. This latter set of tests within the Arctic Circle has been rendered possible by the kind co-operation of Mr. S. Frisell and his Company, Swedish Iron Ore, Limited. Full particulars of the conditions of testing at all sites (except Abisko) are given in the Report.

The work has now been proceeding for a sufficient length of time to enable observations to be begun as to the effect of exposure on a variety of steels and wrought iron under different conditions of surface preparation and painting. Great interest is taken in the work by the industry, as represented by both manufacturers and consumers, and also by the Government Services. A study of the causes of marine corrosion has been commenced, and valuable assistance towards this object has been obtained by the appointment, as members of the Committee, of Mr. E. D. Meryon, Superintendent of Contract Works, Naval Construction Department, Admiralty, and Dr. J. Montgomerie, Chief Surveyor of Lloyd's, by their respective authorities.

A Sub-Committee under the Chairmanship of Mr. U. R. Evans is likewise studying the question of laboratory corrosion tests and short-time tests, and another investigation on the influence on corrosion of inclusions in steel is also in progress with the aid of a grant from the Carnegie Research Fund of the Institute. This latter work is being carried out at Birmingham University.

The PRESIDENT moved the adoption of the report and statement of accounts, which was carried.

Presentation of the Bessemer Gold Medal.

The PRESIDENT said it was his very pleasant duty to present the Bessemer Gold Medal to Prof. Henry Louis, upon whom the choice of the Council had fallen this year for the award of this high distinction. Prof. Louis was an old friend of all of them, and needed no introduction. His career, as was well known, had been mainly associated with the science of mining and the many problems relating thereto, such as the mining and treatment of iron ore and, incidentally, of coal. In other words, his principal work had been the study of the crude materials of the iron industry and adapting them to the best form for use in that industry.

Prof. Louis was one of that band of eminent men who were trained at the Royal School of Mines under Dr. John Percy. He gave early manifestation of his ability by taking first place in the list of his contemporaries in his first year and again in his second. In his third year he gained his Associateship in mining and metallurgy, and was once more first on the list of the examination in both subjects, thereby winning the De la Beche Medal for that year.

It was appropriate to call to mind that Prof. Louis began his active work as an ironworks chemist and that in his earlier days he had been engaged in practically every branch of iron and steel manufacture. Much of his experience was

gained in South Wales, and for a time he worked under his (the speaker's) father, who was at that time associated with Dr. William Siemens at the Landore Steel Works, near Swansea.

In 1896 (continued the speaker) he was appointed to the Chair of Mining in Armstrong College in the University of Durham, and shortly afterwards to the William Cochrane Lectureship in Metallurgy. To Prof. Louis belonged the credit of being the first to introduce elementary metallurgy and metallography as a part of the curriculum of naval architecture and engineering, and other Universities soon followed his example.

Since his retirement from active work in Armstrong College, Prof. Louis had continued to take a keen interest in researches bearing on those subjects with which his work had been principally identified. One of the most important of these was the question of the use of steel supports in mines in replacement of timber, of which he had made a special study.

In presenting the Bessemer Medal to Prof. Louis, the President expressed to him the heartiest congratulations and the hope that he might hold it, with his many other distinctions, for many years to come.

Professor Louis, in acknowledging the presentation, said his first duty—and it was a very pleasant one—was to return his very sincere thanks for the honour which the Institute had done him in awarding him the Medal and in putting his name on the list of the distinguished previous holders of it. He could only say that he appreciated the honour very deeply and sincerely. If anything could add to the gratification which the award of the Medal had given him it was the fact, to which the President had alluded—that his first experience in steel-making had been gained at Landore under Sir Charles' distinguished father. He said "steel-making" advisedly, because he had had the privilege while at Landore of actually making steel; that was to say, he had worked on the stage as a melter and with his own hands had done practically every part of the work; and he would remind the members that in those days it was very different work from what it was to-day. The furnaces were very much smaller and they had to be charged by hand. At the same time the President had been quite right in saying that steel-making had only been an episode in his (the speaker's) career. His main work had been the extraction of the crude material for the iron and steel industry and its preparation in what he ventured to consider the most suitable form for use in that industry.

Continuing, Prof. Louis said he would like to say a few words on that subject, because he did not think its importance was sufficiently recognised in this country. They were in the iron and steel trade not for the good of their health or from any philanthropic motives, but they were in it in the hopes (he was afraid in the somewhat illusive hopes) of making a profit—of producing their material at a lower price than their competitors were prepared to sell it at in the world's markets. Obviously one of the main helps in attaining that end would be to produce material as efficiently and as cheaply as they could. He thought he might fairly say that, in spite of the efforts of so many inventors, the blast-furnace was still holding its own. They still began their work by making pig-iron, and it was important to produce that pig-iron (their basic material) as cheaply as they possibly could. He was not suggesting that he had seen no improvements in his career. When he had started iron-making, a furnace that was making 100 tons a day was supposed to be doing very good work indeed. To-day there were blast furnaces making 1,000 tons a day.

The raw materials which Nature furnished were four-fold. There was first of all the oxide of iron and the iron-ore which iron and steel makers wanted to present to their furnaces under the best possible conditions. Next there was the carbon and the coke, which played a two-fold rôle. It was there—and perhaps was the most important on that account—first of all as a fuel generating the necessary heat, as a reducing agent to reduce the oxide of iron to a metallic state; and it was there to combine with the reduced iron, forming the pig-iron. Then there was the oxygen, which he need not remind those present was now, on account of the invention of the hot blast, presented in a far more economical form than it had been ages ago; and he ventured to suggest that there was still room for improvement. Lastly, there were the fluxes which made their slag. Those were the four ingredients which Nature furnished iron and steel makers with, and it was their duty to obtain in the best physical and chemical conditions for making iron as cheaply as possible.

He would remind them that they had a good way to go yet. He had been looking at some figures recently, and he found that the average consumption of fuel in this country was 50 per cent. higher per ton of pig-iron than the average consumption of fuel in Germany. He had had the figures quite recently, and he thought they could be taken as absolutely correct. That

Professor Henry Louis.

(*Bessemer Gold Medallist.*)

Professor Henry Louis was educated at the City of London School, became Government Exhibitioner, Science and Art Department, entered the Royal School of Mines in 1873, and took the associateship in Mining and Metallurgy in 1876, with the first place in each subject, and was awarded the De la Beche Medal. He was engaged in iron and steel works in Nova Scotia, Swansea, and later had experience in gold-mining in South America, West Africa, etc.; gold and diamond mining in Transvaal and South Africa; Past-President, Iron and Steel Institute; Past-President, Institution of Mining Engineers, and Hon. Foreign Secretary; medal of Institution; late delegate of Institution to Empire Congress of Mining and Metallurgy; Delegate to F.A.B.I. at Brussels and to International Congress of Mining, Metallurgy and Applied Geology at Liége; Member of Council, Institution of Mining and Metallurgy; Past-President, Society of Chemical Industry; Hon. Member, Soc. Chim. Industrielle; Emeritus Prof. of Mining; Professor of Mining, 1896-1923, and William Cochrane Lecturer on Metallurgy, Armstrong College, University of Durham; Member, late Royal Commission on Mining Subsidence; Secretary, North of England Institute of Mining and Mechanical Engineers; consulting engineer to numerous mining and metallurgical companies.

showed that they had a good deal to do yet, and he ventured to suggest that one of the ways of getting that consumption of fuel down, and therefore cheapening their production of the material upon which they depended as their starting point, was by taking care that all the materials put into the blast furnace were presented in the best possible physical and chemical condition for their action. He wanted to point out that in his opinion it was an utter fallacy to suppose that the cheapest iron-ore necessarily made the cheapest pig-iron. Many other considerations had to be taken into account. He had devoted his work mainly to forwarding that object as far as any one man could. He was still deeply interested in the subject, and he could only conclude as he had begun, by thanking all the members of the Institute for the very great honour they had done him, and for their patience with which they had listened to his explanation of the work to which he had devoted his career.

New Members.

The following is a list of Members and Associates elected at the annual meeting.

Proposed as Members.

Allen, William Selwyn, Rotherham, construction engineer; Arnold, Captain John Falk, Gosport, education officer, R.A.F.; Barron, Edward T., Pittsburgh, U.S.A., assistant metallurgical engineer; Bayliss, Percival Samuel, Wolverhampton, company director; Bosio, Dr.-Ing. Emilio, Italy, director; Brace, Porter Hiscock, East Pittsburgh, U.S.A., research metallurgist; Chiesa, Ing. Cav. Quinto, Italy, engineer; Clapham, Dorothy P., Woolwich, metallurgical chemist; Dancaster, Henry William, South Shields, mill manager; Dhanbhoora, Darasha Rustomji, South Kensington, student in metallurgy; Dunkley, Stanley FitzRoy, Weybridge, engineer metallurgist; Fallon, J., Warwickshire, managing director; Fokes, Lionel George, Walton-on-Thames, editor; Hannah, James Dickson, Manchester, metallurgist; Jones, Lloyd, Ohio, U.S.A., general manager; Keen, Charles H., Llanishen, Glamorganshire, works manager; Krishna Rao, Dharapur Varahamurti, Bhadravati, India, metallurgist; Myers, Richard Harold, Wimbledon, S.W.20, metallurgist; Needleman, Benjamin, Transvaal, metallurgical analyst; Oldham, Maurice Charles, Barrow-in-Furness, chief metallurgical chemist; Perry, Archibald Laurence Hillyer, Runcorn, Cheshire, metallurgist; Praeger, Louis, Birmingham, furnace engineer; Roy, Labanya Mohon, Sheffield, assistant smelter; Smith, Cyril Stanley, Waterbury, U.S.A., research metallurgist; Swiderski, Jan, Le Havre, France, engineer inspector; Turner, John Henry, Erith, engineer; Young, Gavin Allan, Bengal, engineer; Yukawa, Masao, Yawata, Japan, engineer.

Associates.

Bennett, John Stuart, Leeds, moulder (pupil); Bhagat, Raghnathrai, Jamshedpur, India, student; Elliot, G. Douglas, Scunthorpe, assistant blast-furnace manager; Hallett, Michael Mountjoy, Penarth, Glam., metallurgist; Homer, Charles Egbert, Kidderminster, research student; Howells, Daniel Clifford, Kidwelly, Carm., student of metallurgy; Kenneford, Arthur Spencer, Manchester, research student; Lumb, Charles Edward, Kingston Hill, Surrey, assistant metallurgist; Mehta, Faredoon P., Sheffield, student; Riddihough, Maurice, Sheffield, student; Smith, William James Burling, Whitecraigs, Renfrewshire, student of metallurgy.

Foreign Manufacturers in Great Britain.

NEW WORKS PROJECTED.

The London Chamber of Commerce informs us that inquiries by foreign manufacturing concerns for information regarding factories and sites in this country are still being received by the Chamber, which has, during the past six months, and still is, acting as the central clearing house for these inquiries. A number of inquiries have matured into definite decisions to establish factories in this country, and the London Chamber of Commerce is now able to report that over 70 foreign concerns have decided to manufacture their products here. The names of the firms in question are not disclosed, but it is known that works have been or are being established for the manufacture of (1) nails, screws, etc., at Slough, and also in North-West London; (2) excavating machinery at Letchworth; (3) engineers' products (class not stated) at Welwyn; and (4) hardware at Birmingham.

Inquiries recently have been received from Germany with regard to the manufacture of bolts and nuts and of heavy chemicals, while an inquiry from France relates to the production of wire netting in this country.

A Practical Discussion on Steel-Foundry Practice.

SPHERICAL FEEDER HEADS ADVOCATED.

In a recent issue we published a very practical Paper, read before the Sheffield Section of the Institute of British Foundrymen by Mr. C. D. Pollard, on "Steel Foundry Practice." The following brings into relief the high lights of the subsequent discussion.

The CHAIRMAN (Mr. G. L. Oxley) said they had listened with great interest to Mr. Pollard, whose Paper was full of the results of investigation work by him.

Foundrymen as Salesmen.

MR. A. ROEBUCK said he entirely agreed with Mr. Pollard in his remarks regarding the need of more technical representation, as one might put it, on the selling side of foundry goods. That was not easy to bring about. He wondered if Mr. Pollard could go into his foundry and pick out one or two men who could be put on to the road to sell the castings; but perhaps that was not a fair question. He knew what Mr. Pollard meant, and they in Sheffield were realising the truth of what he had said. The Institute of British Foundrymen had always encouraged the introduction of technical courses at the University, and Mr. Pollard himself did admirable work in this connection with the Sheffield trade societies. It, of course, did not follow a well-trained technician would make a good salesman. The other point that Mr. Pollard had stressed and which could never be over-emphasised, was the question of team work. He had been in some foundries where the patternmaker said what had to be done and the foundry had to follow. He had been in others where the foundry could have what it wanted, choose what might be the cost of the pattern. After all, the most economical method of production in the interest of the firm was the thing that mattered. It sounded easy, but was not always easy to achieve. Mr. Pollard had mentioned that he thought 30 to 50 per cent. of excess material over and above the net weight of the casting was a good practice. When he (the speaker) was in Belgium two years ago, in two of the important factories there he was told that 25 per cent. was a reasonable figure. He wondered if Mr. Pollard could enlighten them further on that point. Then there was the question of planning. That was of considerable interest to him. He was very pleased to hear Mr. Pollard say that after all it was not possible rigidly to plan, especially in a jobbing foundry. He agreed with the lecturer that all the details of the planning should be in the hands of the foundry manager. The wisest policy was close collaboration with the foundry manager when planning a job.

Spherical Feeder Heads.

MR. BARKER, speaking in regard to outside representatives, said he had known cases where the only information given respecting a faulty casting was that it suffered from blow holes—a ridiculously vague explanation. Mr. Pollard had rightly stressed that if a representative knew more about the actual work of the foundry he would be able to supply more adequate reports dealing with any complaint. Referring to bottle-neck feeders he asked Mr. Pollard how he would overcome the difficulty if he was making gear blanks and the like where it was necessary to utilise bottle necks. He was surprised to hear Mr. Pollard found compo to be dearer than the sand used in steel foundries to-day. In his experience it was the contrary. Speaking about the annealing of castings he agreed that annealing did a great deal of damage in many cases to good results that came out of the foundry. From personal experience he had found that if in the case of large castings where unequal expansion and contraction was encountered, it was best to remove the heads whilst warm. He cited a large diameter gear wheel which, during annealing, still had numerous heavy risers on the rim and a large head on the boss which nearly touched the roof. The weight of these headers caused damage during the cooling of the casting.

Dealing with the questions, MR. POLLARD said that so far as the question of excess material in the production of steel castings was concerned in the jobbing foundry, the amount of excess material varied from just sufficient to run the steel into a mould, without any feeder-head allowance, up to 200 or probably 250 per cent. of excess over the net weight of the casting which is being produced. Everything depended on the design and the type of casting. What he had said was: "It is possible to carry out effective feeding with 30 to 50 per cent. of excess material when heads were correctly shaped, whereas 100 per cent. would not do it if badly-shaped heads were attached." That had to be qualified, of course, and was not to be taken as a hard-and-fast figure as to the ratio of excess over the actual casting produced. He hoped that there would be further expressions of views from the meeting relating to planning. He believed that planning schemes were as numerous as foundries themselves. He himself was rather keen on that aspect of the business. He was always interested to hear what other people had to say about the temperature of steel. Naturally the varying temperatures at which they poured steel castings seriously affected contraction results, that is, if they used the same size and shaped-feeder heads on similar castings and poured at different temperatures. In aiming at the successful production of steel castings they had to discover the best temperature for various jobs and the most serviceable size of feeder head. He maintained that the spherical shape of feeder head was the best. Unfortunately, in a jobbing steel foundry they did not get large quantities ordered sufficiently often to give them the opportunity of making comparisons with the different methods to enable them to come to a decision on temperatures, and experience had to govern production in such cases. In regard to the question as to why the spherical head gave the most successful result—he was aware that he was only giving a very quick review of the facts—he thought that the radiation of heat from a feeder head was probably the most important influence on the reservoir of steel that they wished to maintain, and that with the spherical head the effect of radiation was not so severe on that reservoir as would be the case if they had rectangular- or square-shaped feeders. With a spherical shape of exactly the same cubic capacity as other shaped heads the reserve of steel was held nearer to the casting-proper than in other cases. The reserve was brought down to as near the casting face as it was possible by the spherical-shaped feeder. There was no bottle-neck or adjustment of that type to the casting of any great length, and, in his view, that was the reason for the spherical shape being more successful than the bottle-neck or long parallel-shaped heads. So far as Mr. Barker's question about gear blanks was concerned, he would not put bottle-necked feeders on in any case. He did not think that bottle-neck heads would do what was required of them. Regarding what Mr. Barker had said about the price of compo, all he could say was that he wished Mr. Barker had been the man who had been buying his (the speaker's) compo for many years.

MR. LEETCH asked whether, in the case of manganese steel, the lecturer could give any idea of the temperature necessary to control the dendritic structure. He would also like to know why Mr. Pollard objected to chills. He was aware that great care had to be used with chills in relation to the castings, but they were often very helpful. Then in regard to the spherical-shaped head that had been referred to, he was curious to know who made the head, for the mould of that shape would be difficult.

Manganese Steel.

MR. POLLARD said that the question of the effective temperature of manganese-steel castings was rather a keen one. The dendritic structure found in manganese castings was caused not only by the temperature of the steel during pouring, but by the uneven cooling effect, often due to the design. The problem represented a side of the business that needed very careful attention, and local hot spots in manganese-steel castings should be avoided if at all possible. In regard to chills, he had hoped that more people would have discussed the question. He knew that opinions were very divided on the matter. In the production of castings for high steam pressure, turbines, etc., such as had been illustrated, his opinion was that, for several reasons, the use of chills was definitely detrimental. There was one pronounced reason. When closing a mould of this type they could not do it in an hour; in fact, they could not do it in a day, because of the number of cores which had to be inserted. The chills would necessarily have been fixed in the mould or cores at the commencement of the operation. Could anybody tell him that when they closed those moulds those chills were definitely clean? If anybody could convince him on that point he would always utilise chills. His experience was that in every case chills would have caused trouble, even although it may be slight. Therefore in dealing with steel castings for high-pressure work he thought it was dangerous to use chills. However, steel-foundry people had to agree to disagree on such questions and any expressions of opinion were to the benefit of all concerned. He still insisted that there had been insufficient expression of opinion in Sheffield on some of the difficulties of producing steel castings. In regard to the spherical head it was amazing how many times they could put that type of head on to a casting as easy as they could attach parallel-shaped head or a bottle-neck head. He wanted to stress the advantages of the spherical-shaped head on the ground of cubic capacity. He thought that if any of them had not previously tried spherical-shaped heads and were to try them now they would be amazed at the results that they could obtain.

Replying to an observation relating to the extra width of a spherical head, MR. POLLARD said that the head, being squat, enabled the contents between the casting face and the upper portion of feeder head to be kept in a liquid condition because of the amount of steel that was round it. In addition to that the hottest steel in the feeder head was so near the bottom of the feeder that the sand at this position was kept hot because of the radiation of heat from the steel surrounding it.

MR. BARKER said he assumed the lecturer would not suggest putting brackets on castings of, say, 1 in. thick and running into ½-in. sections when the casting would solidify as quickly as the brackets and therefore be useless.

MR. POLLARD said that chills in compo moulds of any magnitude were a dangerous proposition. If they put chills on certain castings some interference with feeding would be caused. If they put brackets on they would aid the weaker spots during cooling. Chills in the right place may be satisfactory, but if they did not consider the method for running and feeding the casting, chilling may be detrimental. He would certainly prefer brackets to chills for the weak places during the cooling period, because chills could not possibly function as brackets did.

Vote of Thanks.

Proposing a vote of thanks to Mr. Pollard, Mr. J. E. Hurst said he took that opportunity of speaking on behalf of the modest iron-foundry members. As an iron-foundry member himself engaged in the production of very tiny castings he could not have contributed anything useful to the discussion. In fact he envied those people who could contribute to a discussion on a Paper of this sort. In listening to Mr. Pollard dealing with large castings he felt once again that he could appreciate the truth of the old proverb: "Every cobbler to his last." In the area embraced by the Sheffield Section of the Institute of Foundrymen he was afraid that in the past they had not had as many Papers and lectures on the subject of steel castings as was warranted. They had been very fortunate in getting Mr. Pollard to give them his Paper. In this respect they had done something to remedy the defect.

Mr. J. Roxburgh seconded the vote of thanks and said it was always interesting to hear about other people's troubles. He could quite realise that in the steel foundry the question of feeding and of chilling presented very great difficulties as did also the question of the treatment of the casting after it had been manufactured. He had been very much interested in Mr. Pollard's remarks about planning and was much struck by what the lecturer had said in regard to planning in reference to getting the output up to a certain standard and to meet the requirements of the customer with regard to delivery. What he thought was really more important from the manager's standpoint was that when a drawing was received the manager should be sufficiently versed in both the practical and the technical sides to be able to send for his foreman patternmaker, his foreman moulder, his foreman coremaker and his metallurgist finally and discuss there and then the method of manufacture so that the job could be planned right from the beginning and also from the metallurgist standpoint. He thought that that planning was really more important than the planning of the progress of the job through the works, although he realised, at the same time, that the latter was essential for the efficiency of a business.

Mr. Pollard acknowledged the vote of thanks. He was pleased that Mr. Roxburgh had enlarged on the question of planning for it proved that there was someone in the room more capable than he (the speaker) was of saying what he wanted to say on that matter. Mr. Roxburgh had voiced precisely his idea about the foundry manager consulting with his foreman.

Douglas Motors, Limited.

A new company, known as Douglas Motors (1932), Limited, has been formed to take over the whole of the goodwill, property and assets of Douglas Motors, Limited, of Kingswood, Bristol. The freehold factories, covering some 23 acres, are self-contained to an unusual degree and are well equipped with every facility for producing the modern type of motor cycle, which demands the utmost precision in all stages of manufacture.

Faraday Medal.—This medal has been presented to Sir Oliver Lodge by the Institution of Electrical Engineers, of which he is an honorary member. This was the eleventh award of the medal, which was founded in 1921. It is awarded by the Council of the Institution not more frequently than once a year, either for notable scientific or industrial achievement in electrical engineering, or for conspicuous service rendered to the advancement of electrical science, without restriction as regards nationality, country, or residence, or membership of the Institution.

Foundry Selling Practice.

By Eric N. Simons.

THE METALLURGIST AND ADVERTISING.

In the majority of foundries, there is far too great a tendency to regard the advertising the firm does as something in a watertight compartment, something beneath the dignity of the technical man to inquire into or to take notice of (in any other than a depreciatory sense), something in which he has no share. This, to my way of thinking, is a mistake. While it is perfectly true that advertising is a skilled job, demanding qualities utterly different from those implicit in production or labour management, it does not follow that advertising can carry on without the technical man or *vice versa*. There should, and must, in efficient selling, be the closest possible co-operation between both sections of the business.

Now there are two schools of thought in regard to advertising in foundries. The first school argues that only a trained technician can really advertise castings, and the advertising manager should therefore be a trained metallurgist, or foundry expert. The other school holds that it is better for the advertising man to know nothing of technicalities, so that he will not hold strong views and print things on his own initiative that the technical men would disagree with. There is something to be said for both schools; but it is preferable to argue that, while technical knowledge can never be a handicap to the advertising man, and will often be a help, it should not be the first requisite. The first requisite is experience and knowledge of publicity work, and the second, tact and the ability to extract from the technical men all the knowledge they hold.

In the first place, the life-blood of foundry advertising is facts, and for facts the advertising man has to go to the technician. If the technician will not give up his facts, something is wrong, and it can be frankly stated that more often than not, what is wrong is the temperament of the advertising man. There are advertising managers still to be met with whose notion of advertising a casting is to draw an eagle tearing out the liver of Prometheus, and declare in bold black letters: "As the eagle tore for ever at the vitals of Prometheus, so do Blank's castings go on for ever in the machine of the user," or some such rot!

Quite rightly, the technical men laugh at that type of advertising, and if the advertising man ignores their laughter, and serenely pursues his allegorical way, there is some excuse for the metallurgists ignoring him, should he ever solicit facts from them. It must be remembered that whatever seems ridiculous to your own metallurgists will seem equally ridiculous to the metallurgists to whom you are advertising. This allegorical or pretty-pretty type of announcement is, candidly, the refuge of the advertiser who has no technical knowledge whatsoever, and seeks to hide the fact, or who cannot get on with his colleagues, and can get no facts from them.

Technical men often have a ridiculous prejudice against advertising; but they will not deliberately hinder the advertising of their own firm by withholding information, openly or tacitly, unless they have a reason. It is definitely not essential that every casting advertisement should be submitted to a committee of foundry experts, but experience has shown that very few advertisements would ever see the light if that happened. One cannot sit down and teach one's colleagues the whole profession of advertising every time one asks their approval of an advertisement, and that is what one would have to do in such a case. But there are a few golden rules for ensuring the help and co-operation of the foundry experts in framing and designing advertisements. These, from the limpid depths of personal experience, the author has set down below, for the guidance of sales and advertising managers.

(1) Never show a draft advertisement to a technical man unless it has been laid out neatly and skilfully, or has been set up in type. Technical men are apt to think a rough pull of a block represents the final result, and this will make them think ill of the whole advertisement.

(2) Never ask technical men to suggest headlines. The result will be appalling. The headlines are the advertisement manager's job. Do not ask for criticism of headlines, but if they laugh, ask why.

(3) Never ask a technical man for facts. Tell him some, and let him contradict you. That is the way to learn.

(4) If the advertisement manager cannot get information from a foundry expert, either because he won't give it or because he can't express himself concisely, the former should not worry, but he should invent some information and blandly assert that that is what is going to appear in print. He will soon object. One must ignore his aspersions on one's intelligence, so long as the objective is gained.

(5) If a metallurgist who does not believe in advertising is encountered, and will not help you, cut out some competing advertisements and tell him you want to write a counterblast for the Press. He will be so annoyed at what the other folk say about their goods that he will produce some red-hot copy in two seconds.

(6) Realise from the start that the technical man knows more about the castings than the sales side, and let him see it is realised. Do not let him think he is being asked for facts out of politeness, or perfunctorily. If he outlines some good points, tell him so, and he will be interested in that advertisement when it appears.

(7) Make a point of meeting the experts. Get among them, especially at meals. In this way one quickly gathers what is happening in the foundry; what new developments are taking place; what new work is in hand; what changes in manufacture or composition have occurred. All this will provide valuable material for publicity.

(8) Make your experts interested in advertising, especially in the firm's advertising. Tell them some of the results. They might not believe it, but constant dropping . . . etc.

Following these golden rules will, it is certain, improve foundry advertising, and fill it chock-full of those specific facts that alone convince customers and lead to bigger sales.

(*To be continued.*)

Catalogues Received.

Lifting Appliances. — The Paterson Hughes Engineering Company, Limited, Windsor House, Victoria Street, London, S.W.1, has sent us an advance copy of list 16, which, in its 24 well-illustrated pages, covers a number of interesting examples of mechanical handling propositions. The brochure covers ordinary and electric hoist blocks, overhead runways, electric telphers and accessory material. On page 3 there is illustrated a push travel electric hoist block, with perambulator control, which is typical of an application likely to overcome a local difficulty. It is just this type of suggestive application which makes the catalogue so useful for foundries which are mechanising the movements of their materials.

Electric Motors.—Stock List No. 151 has been received from Higgs Motors, Limited, Witton, Birmingham.

Mining & Industrial Equipment, Limited, report having received orders for three Rovac filters, six Hum-mer screens, a Raymond separating plant, and an Andrews de-slimer, for installation at home works, and two Raymond pulverisers and a Raymond mill for installation abroad.

S&L

PIG IRON

WE PRODUCE

IN NORTHAMPTONSHIRE
LLOYDS and ISLIP Brands
IN STAFFORDSHIRE
S.V.H. Brand

In suitable qualities for the manufacture of:
HIGH CLASS ENGINEERING CASTINGS, MOTOR CYLINDERS, LIGHT CASTINGS, RAINWATER GOODS, BATHS, RANGES, GRATES, STOVES, HOLLOW WARE and all FOUNDRY PURPOSES.

We also make Forge Iron for Wrought Iron Makers and Basic Iron for Steel Works use.

RANGE OF ANALYSIS

SILICON: ·50% to 5%
SULPHUR: trace to ·10%
MANGANESE: ·30% to 4%
PHOSPHORUS: ·50% and upwards

PROPRIETORS OF LOWICK GANISTER
AS USED BY THE LEADING IRON FOUNDERS.

STEWARTS AND LLOYDS LTD

SALES OFFICE: **BROAD STREET CHAMBERS, BIRMINGHAM.**
LONDON OFFICE: **WINCHESTER HOUSE, OLD BROAD STREET, LONDON, E.C.2.**
CARDIFF OFFICE: **HANNAH STREET, DOCKS.**

This Week's News in Brief.

Trade Talk.

Messrs. David White & Company, Limited, Kinning Park, Glasgow, have secured an order for a passenger motor boat for the Coatbridge Corporation.

The Cunard liner "Carmania" (20,000 tons) arrived at the ship-breaking yard of Messrs. Hughes, Bolchow, Limited, at Blyth, recently for breaking-up.

The Glasgow and West of Scotland Association of Foremen Engineers and Draughtsmen have arranged a special visit to the works of Messrs. John Lang & Sons, Limited, Johnstone, on May 13.

The British Cast Iron Research Association, having entered new premises adjacent to those recently occupied until they were damaged by fire, the council has decided to organise an official re-opening early in July.

Messrs. Harland & Wolff launched from their Govan yard the new turbine luxury steamer, "Duchess of Hamilton," which they have built for the Clyde coast service of the London Midland & Scottish Railway Company.

Messrs. Philips Lamps, Limited, of Philips House, 145, Charing Cross Road, London, W.C.2, gave a demonstration this week of their "Metalix" industrial X-ray apparatus. The apparatus, which is mobile, will reveal defects in metal at a depth of between 3 and 4 in

The new British destroyer "Dainty" has been launched by the Fairfield Shipbuilding & Engineering Company, Limited, Govan, Glasgow. The propelling machinery is being built and installed by the Fairfield Company. The company will launch a sister ship, H.M.S. "Delight," on June 2.

Messrs. John Lewis & Sons, Aberdeen, launched a steel steam trawler and liner, the "Fort Ryan," which they built to the order of the associated firm of John Lewis, Limited, and has been fitted with all the most modern improvements, including an Echo sounding device, which gives instantaneous reading of the depth of water in which the vessel is operating.

The Foundry Institute of the Aachen Technical High School has recently added a new melting shop. This is to be officially opened by the rector on Saturday, May 21. Prof. Piwowarsky will outline the work of the Foundry Institute, and Dr. Nipper is to lecture on his recent visit to America. The ceremony will conclude with a "beer evening" in the local hydro.

The Stanton Ironworks Company, Limited, near Nottingham, having acquired a controlling interest in the Wellingborough Iron Company, Limited, have decided to erect a new furnace plant similar to the modern plant recently set to work at Stanton. The present furnace plant will be kept in operation up to July 31 next, when the reconstruction work will be taken in hand.

Messrs. David & William Henderson & Company, Limited, launched from their Meadowside yard, Glasgow, a steel screw cargo steamer, which they built to the order of Messrs. Hogarth & Sons, Glasgow. The "Baron Ardrossan" is of 3,850 tons gross, and will be fitted with triple expansion engines having cylinders 21½ in., 37 in., 62 in. by 42 in. stroke, with a steam from two single-ended boilers working at 210 lbs. working pressure.

Mr. Arthur Dorman, presiding over a meeting at Grangetown to consider measures to help men at present unemployed, said he believed that there was a better chance for more men to be employed in the iron and steel industry of the district. That was something he had been unable to say for a long time. He did not mean that there was to be any immediate uphill turn, but there were signs that there would be a slight increase, which by the autumn months should be larger.

In its Business Forecast for the second quarter of 1932 the Federation of British Industries states that no material alteration in world conditions has occurred since the publication of the Forecast for the first quarter. The most serious centre of instability continues to be Central Europe. Great Britain has made good use of the elasticity and freedom of movement which she regained by her departure from the gold standard last September. Money rates have fallen and should continue to fall. On the industrial side the new tariff has already been fruitful in alleviating unemployment and promoting the setting up of new industries. The conference at Ottawa, and the commercial agreements which will doubtless be negotiated subsequently with other countries, should serve to consolidate a *bloc* of sterling inter-trading areas. It should also help to bring to an end the period of falling prices. Unfortunately progress in all these directions is bound to be slow. The situation elsewhere continues to deteriorate and the debt problem (including commercial as well as war debts) is as insoluble as ever.

Personal.

Mr. E. V. Parkinson, of Cudworth, Yorkshire, has resigned his appointment as chief metallurgist to the Tata Iron & Steel Company, Limited, India, and is returning to England.

Mr. Henry Toy, of Toy & Company, brass and iron founders, etc., Helston, was last week re-elected chairman of the Finance Committee of the Cornwall County Council for two years.

Mr. J. M. Colville, a son of the late Mr. Archibald Colville, has been appointed works manager of the Dalzell Steel Works, Motherwell, in succession to the late Mr. R. S. Wilson, J.P.

Sir H. C. Harold Carpenter, F.R.S., has been awarded the Gold Medal of the Institution of Mining and Metallurgy in recognition of his eminent services in the advancement of metallurgical science and technology.

Dr. Thomas A. Rickard has been awarded the Gold Medal of the Institution of Mining and Metallurgy in recognition of his services in the general advancement of mining engineering, with special reference to his contributions to technical and historical literature.

Mr. John Craig, C.B.E., chairman of Colville's, Limited, Motherwell, and Mr. Gavin Cowper, sailed to Canada with the trade mission ship "Letitia," which left the Clyde on May 5. The exhibits on the ship included examples of the products of Colville's, Limited, and also of the Lanarkshire Steel Works, who also have a representative accompanying the mission.

Mr. George A. Mitchell, who was until recently a director of Messrs. Stewarts & Lloyds, Limited, and a former President of the Glasgow Chamber of Commerce and of the Association of British Chambers of Commerce, was entertained to dinner in the Central Hotel, Glasgow, on May 2 on the occasion of his retirement, by members of the Scottish Steelmakers' Association. Mr. John Craig, C.B.E., of Colville's, Limited, presided, and acknowledged the services which Mr. Mitchell had rendered to the Scottish steel trade during his 25 years' association with it, and expressed the good wishes of the members of the association and also of himself and colleagues of the Scottish Trade Mission to Mr. Mitchell.

Wills.

Dayson, W. O., of Swansea, mechanical engineer, formerly an official of the Ebbw Vale Steel, Iron & Coal Company, Limited	£2,493
Taylor, William, of Crompton, Lancashire, managing director of Messrs. Buckley & Taylor, Limited, engineers and ironfounders	£11,766
Thomas, Sir Thomas Powell, of Dinas Powis, founder of the firm of T. P. Thomas & Company, coal exporters and pitwood importers	£61,215
Glover, R. M., of Stamfordham, Northumberland, late of Messrs. Bessler, Waechter, Glover & Company, Limited, coal exporters	£33,146

Obituary.

Mr. George Longden, engineer, of Sheffield, has died at the age of 68. Born at Brightside in 1864, Mr. Longden became associated with the late Mr. John Dewhurst, mill furnisher, with whom he entered into partnership. Mr. Longden was a director of Dewhursts Engineering Company, Limited, up to the time of the company ceasing to carry on business.

Company Reports.

Glenfield & Kennedy, Limited.—Final dividend on the ordinary capital of 6 per cent., making 10 per cent., less tax, for the year.

Johnson & Phillips, Limited.—Net profit, £35,494; dividend of 5 per cent.; to reserve and development account, £5,000; carried forward, £102,717.

Motherwell Iron & Steel Company, Limited.—Manufacturing profit, £199; provision for ordinary overhead expenses, £5,948; interest on bond and debenture stocks, £7,585; debit balance for year, £13,335.

Contracts Open.

High Wycombe, May 23.—Electrically-driven centrifugal borehole and surface pumps, for the Chepping Wycombe Town Council. Mr. W. Vaux Graham, 5, Queen Anne's Gate, Westminster, S.W.1. (Fee £5, returnable.)

Stockton, May 18.—Retort-house steel framing, steel roof, furnaces, retorts, coal plant, coke-handling plant, etc., for the Town Council. The General Manager, Gasworks, Thompson Street, Stockton-on-Tees. (Fee £3 3s., returnable.)

The Plastic Deformation of Metals.

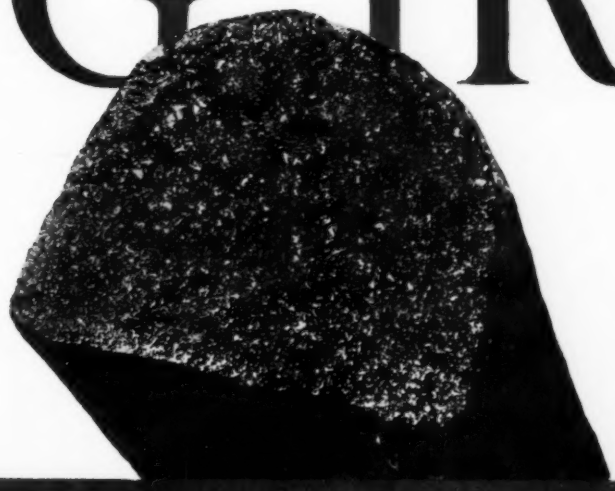
Prof. Dr. F. Körber, Director, Kaiser Wilhelm-Institut für Eisenforschung, Düsseldorf, delivered the twenty-second annual May lecture of the Institute of Metals in London last night on "The Plastic Deformation of Metals." The results of the researches set out in the lecture undoubtedly constitutes a considerable enrichment of knowledge of the subject of metal working.

Basing his remarks on the results of a series of investigations which had been conducted at Düsseldorf during recent years, the lecturer dealt with the stress relationships and also with the course of the flow of the material which arose during the most important of the mechanical-shaping processes. Discussions were entered into on the conditions requisite for the commencement of plastic flow and also on the possibility of drawing conclusions from the resulting flow phenomena as to the distribution of stress in the material at the inception of deformation. The disturbances in the material in consequence of the more marked deformations in drawing, extrusion and rolling were traced by a suitable method of investigation. The results were compared with the deformation structures obtained by X-ray methods. The knowledge of the deformation processes so obtained enabled conclusions to be drawn as to the energy or power used in the shaping operations. An exact analysis of the course of deformation in the transition zone lead to reliable estimates of the internal losses during the alterations in form. Quantitative treatment of the stress relationships which occurred in the zone of deformation was possible in so far as the pressure created at the surfaces of contact between the tool and the material was known by actual measurements. From the results of determinations along the roll gap of the pressure between the rolls and the stock being rolled, a complete quantitative presentation of the distribution of stress in the transition zone between the rolls had been formulated.

International Tube Cartel.—We understand that at the International Tube Cartel meeting at Prague last week it was arranged that no more Continental gas, water and steam tubes would be imported into Great Britain.

The 2nd International Aluminium Competition.—A fairly obvious misprint occurred in the announcement issued by the British Aluminium Company, Limited, on advertisement page 11 of our last issue. It stated that prizes totalling 200,000 Swiss francs (say £1,000) are to be awarded. Obviously this should read 20,000 Swiss francs.

PIG IRON



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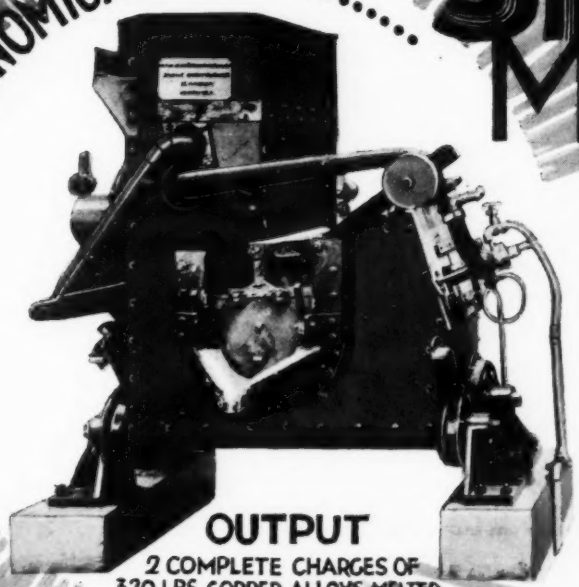

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OIL FIRED FURNACES FOR MELTING GREY IRON AND SEMI-STEEL: Sizes and prices on application.

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XUM

Raw Material Markets.

No increase in actual business is reported from the various iron and steel markets, but there is a more confident undertone and a welcome improvement in the number of inquiries in circulation, both on home and export account. The foundries are making a slightly increased demand for pig-iron, but there is little business passing in either semi-finished or finished steel. The tinplate and galvanised sheet markets have also been very dull lately.

Pig-Iron.

MIDDLESBROUGH.—The pig-iron market is hampered by the excessive caution shown by buyers, but it is possible to see a more healthy movement. The foundrymen are thinking of replenishing their stocks of raw material in anticipation of an improved demand for their products, and more inquiries are being circulated. The export market has been broadening out lately, while sales to Scotland also show an improvement. It is stated that the rates quoted to Scotland do not cover the cost of production, but the Cleveland makers are determined to keep what they can of the market.

Export sales of East Coast hematite are rather limited, but business in the home markets, particularly South Wales, has been on a better level. Heavy stocks are still on offer, however, and prices are weak at 63s. 6d. per ton for mixed numbers and 64s. per ton for No. 1 quality.

LANCASHIRE.—The general level of pig-iron deliveries to consumers is maintained, but the situation of the Lancashire foundries is too poor to offer hopes of any increase in business. The light-castings foundries form the only section showing relative activity. Several big forward contracts for foundry iron have been booked, but these are isolated instances. Prices are unaltered. For delivery to consumers in the Manchester price zone, Midland brands of No. 3—Derbyshire and Staffordshire—are on offer at 67s. per ton, with Cleveland also at 67s., Northamptonshire at 65s. 6d., Derbyshire forge iron at 62s., Scottish pig at 86s. 6d. to 87s., and West Coast hematite at about 81s. Indian pig-iron for delivery in the Manchester district is still obtainable at about 75s. to 77s. per ton.

MIDLANDS.—The majority of the ironfoundries in this area have great difficulty in finding employment, and hand-to-mouth buying is the general rule in the pig-iron market. Few orders of heavy tonnage are being booked. Prices were recently reviewed by the Central Pig-Iron Producers' Association, but no changes were made; the figures are, therefore, 62s. 6d. for Northants No. 3 and 66s. for Staffordshire, Derbyshire and Lincolnshire No. 3, delivered Birmingham and Black Country stations.

SCOTLAND.—Sales of pig-iron in the home market remain on a limited scale. Buyers as a rule have not the confidence to enter into forward contracts. There is no change in the official minimum price of 69s. 6d. for No. 3 Scottish foundry iron, with 2s. 6d. extra for No. 1, f.o.t. furnaces. Export business is extremely slow. Meanwhile, No. 3 Middlesbrough is being quoted at 58s. 6d., and other English irons down to 57s. 6d. f.o.t. Grangemouth. Continental foundry is not being offered at competitive prices.

Coke.

Small buying for immediate delivery continues to be the general practice in this market, the ironfoundries finding business too bad to warrant laying in stocks. Quotations for best Durham foundry coke range from 37s. 6d. to 40s. delivered Birmingham district, with inferior grades at 35s., while Welsh coke varies from 30s. to 45s., according to quality.

Steel.

Little business has been done in the finished-steel trade during the past week. Some of the mills, particularly those on plates and sections, find employment very scarce. Quotations for re-rolled small bars have been increased in one or two cases. A similar slackness prevails in the semis market, where business has been of very small proportions. The full benefit of the new tariff will not be felt until the large stocks of foreign material still held have been absorbed—a process that will take some months to complete.

Scrap.

There has been no improvement in the demand for cast-iron scrap in the Cleveland market. Ordinary heavy metal is on offer at 38s. per ton, and 40s. is the best figure obtainable for good machinery cast iron in handy pieces. Light castings can be bought at about 34s. per ton. Good supplies of iron are available in the Midlands market, but the foundries have not been buying for some time. Heavy machinery, broken into cupola sizes, is offered at 47s. 6d. per ton delivered, good heavy pipe and plate at 42s. 6d. per ton and clean light at 37s. 6d. to 40s. per ton. There is a similar lack of activity in the Scottish market, where first-class machinery cast is indicated at 47s. to 48s. 6d., while ordinary cast-iron scrap to the same specification, i.e., in pieces not exceeding 1 cwt., is at about 42s. 6d. per ton. Light metal is quoted at 37s. 6d. to 38s. 6d. per ton.

Metals.

Copper.—The standard market has remained quiet throughout the week. A little business has been done with consumers, but mostly in "outside" copper, the Exporters themselves taking very few orders. The industrial position on the Continent also shows little improvement, copper consumption being very limited. Copper interests in the U.S.A. continue to agitate for a tariff on imported copper, but it is doubtful whether such a tariff would affect the outside markets, even were it agreed to by the Senate.

Closing quotations :—

Cash.—Thursday, £30 5s. to £30 7s. 6d.; Friday, £29 12s. 6d. to £29 13s. 9d.; Monday, £29 12s. 6d. to £29 15s.; Tuesday, £29 7s. 6d. to £29 10s.; Wednesday, £29 8s. 9d. to £29 11s. 3d.

Three Months.—Thursday, £30 to £30 2s. 6d.; Friday, £29 13s. 9d. to £29 16s. 3d.; Monday, £29 16s. 3d. to £29 17s. 6d.; Tuesday, £29 10s. to £29 12s. 6d.; Wednesday, £29 12s. 6d. to £29 13s. 9d.

Tin.—There was a sharp reaction in values on Monday, standard making a total drop of about £5 per ton. Such a reversal of market feeling was caused by the inevitable profit-taking, by fear of the immense supplies of unsold metal, and by rumours that several of the Governments concerned would never agree to the restriction proposals. It is stated, for instance, that great opposition is likely to be experienced from the Bolivian producers. The American tinplate mills continue to operate at more than 50 per cent. of capacity, an improvement on recent conditions, but it is stated that the rate should be much higher at this time of year. American consumption of tin in other directions remains low.

Official closing prices :—

Cash.—Thursday, £129 5s. to £129 10s.; Friday, £129 10s. to £129 15s.; Monday, £124 10s. to £125; Tuesday, £120 to £120 5s.; Wednesday, £124 7s. 6d. to £124 10s.

Three Months.—Thursday, £131 10s. to £131 15s.; Friday, £131 15s. to £132; Monday, £126 15s. to £127 5s.; Tuesday, £122 to £122 2s. 6d.; Wednesday, £126 7s. 6d. to £126 10s.

Spelter.—Support has been forthcoming for this metal on the expectation of a further cut in output, a scheme for which, it is said, is to be introduced at the meeting of producers. Recent statistics reveal that production in the first quarter of the current year showed a reduction of about 17 per cent. compared with the first quarter of 1931. The East St. Louis spot quotation has been further reduced to 2.50 cents per lb.

Daily fluctuations :—

Ordinary.—Thursday, £13; Friday, £12 18s. 9d.; Monday, £12 16s. 3d.; Tuesday, £12 10s.; Wednesday, £12 12s. 6d.

Lead.—The market has receded slightly, in agreement with the other base metals, there being very little support from consumers. Large stocks of metal are held, both here and by the producers, and the position is regarded as highly unsatisfactory. It is noticeable that shipments of Australian lead have revived considerably this year, reaching an average of about 18,000 tons per month, compared with a monthly average last year of about 11,300 tons.

The week's prices have been :—

Soft Foreign (Prompt).—Thursday, £11 10s.; Friday, £11 7s. 6d.; Monday, £11 1s. 3d.; Tuesday, £10 16s. 3d.; Wednesday, £10 18s. 9d.

Book Review.

Gli Acciai Comuni e Speciali (Ordinary and Special Steels) by Dr. G. Guzzoni. Published by Ulrico Hoepli, Editore, Libraio della Real Casa Milan, Italy. Price 60 lire.

This book is divided into 15 chapters which takes the subject right from the nature of the ores to metallography and comprises some 460 pages. The sort of information included in Chapter I—"Iron and Steel, their characteristics and structure"—has reference to puddled, electrolytic, Armco, sponge irons, critical points, the iron-carbon equilibrium diagram; solidification of steel, structure and thermal treatment; theory of hardening, martensite, and the diagram of stable equilibrium. This has been done by way of introduction, for the majority of the theoretical sections are much elaborated in later chapters.

Chapter II covers the physical properties, including magnetic testing, whilst Chapters III and IV deal with the mechanical properties. The author designates his next section "Secondary Constituents and Impurities in Steel," and follows up with "Gas in Steel." Chapter VII, though dealing in the main with the casting of steel into ingots, has just three pages devoted to steel castings. Chapters on mechanical working (cold, hot, and the influence of various factors); thermal treatment (hardening, tempering and annealing) and special constructional steels, follow in the order indicated. In the last named, manganese steel—both pearlitic and austenitic—are covered. Silicon,, chrome, chrome-nickel, molybdenum and vanadium steels are all dealt with in turn. Chapter XII relates to some of Sheffield's specialities—high-speed and magnet steels, whilst the next section (20 pages) covers the metallurgy of stainless and Staybright varieties of steel. Some of the latest metallurgical developments are outlined in Chapter XIV, for the author describes the nitrarding process, which has been so prominently before the public in recent months. His final chapter is devoted to metallography. If the book had been a technical book written in the English language we should have criticised it as trying to cover too much ground, but, realising Italian conditions—which means a restricted metallurgical public—we have nothing but praise for the excellent balance the author has achieved. We also compliment the publishers and printers on the clarity of the type and the excellence of the illustrations, of which there are about 230.

Continental Steel Cartel.

It would appear from the returns published that none of the member countries of the Continental Steel Cartel produced its full allotment in March. The following figures show in metric tons the actual output of the various groups (and in brackets the deficiency in each case):—Germany, 435,000 (529,000); Belgium, 246,000 (11,000); Luxemburg, 153,000 (23,000); Saar district, 118,000 (21,000); France, 464,000 (196,000); total, 1,416,000 (780,000) metric tons.

Cracks in ferrous metals can be unfailingly detected by magnetic means. The test consists of magnetising the piece being tested, and then pouring over it a hydrocarbon solution containing iron powder. The iron powder will adhere to any cracks.

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SOLID RIBBED ROLLED STEEL
MOULDING BOXES

Whatever in the future may be the varying fortunes of Sterling Currency on the world's exchanges, foundrymen can rest assured there will be no fluctuation in the value of Sterling Moulding Boxes.

If you stick to Sterling Boxes your moulders will do more work and far better work with less effort; they will produce more accurate castings; you will save money on your fettling costs and more than halve your box maintenance costs—indeed there will be greater efficiency and economy all round. We stand by this statement and will gladly prove it.

Sterling moulding boxes are produced in England's largest Foundry Equipment Works and offer you the nearest approach to perfection that science and skill have yet achieved at a price no more expensive than for ordinary boxes.

Wherever castings are made
STERLING BOXES will help to make them
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WEEKLY PRICE CURRENT.

COPPER.

	£	s.	d.
Standard cash	29	8	9
Three months	29	12	6
Electrolytic	33	15	0
Tough	32	0	0
Best selected	32	10	0
Sheets	63	0	0
India	43	10	0
Wire bars	36	10	0
Do., June	35	12	6
Do., July	34	15	0
Ingot bars	36	10	0
H.C. wire rods	38	15	0
Off. av. cash, April	29	19	10½
Do., 3 mths., April	30	4	0 5/8
Do., Sttlmnt., April	29	19	7 5/8
Do., Electro, April	34	12	10 5/8
Do., B.S., April	33	14	2
Do., wire bars, April	35	1	10 5/8
Solid drawn tubes			9½d.
Brazed tubes			9½d.
Wire			6½d.

BRASS.

Solid drawn tubes	9d.
Brazed tubes	11d.
Rods, drawn	7½d.
Rods, extd. or rlld.	4½d.
Sheets to 10 w.g.	7½d.
Wire	7½d.
Rolled metal	7d.
Yellow metal rods	4½d.
Do. 4 × 4 Squares	5½d.
Do. 4 × 3 Sheets	5½d.

TIN.

	£	s.	d.
Standard cash	124	7	6
Three months	126	7	6
English	126	0	0
Bars	123	10	0
Straits	124	5	0
Australian	121	10	0
Eastern	127	5	0
Banca (nom.)	132	0	0
Off. av. cash, April	109	0	10 5/8
Do., 3 mths., April	111	3	6 3/8
Do., Sttlmt., April	109	0	5 5/8

SPELTER.

	£	s.	d.
Ordinary	12	12	6
Remelted	11	15	0
Hard	10	15	0
Electro 99.9	15	5	0
English	13	12	6
India	11	15	0
Zinc dust	22	0	0
Zinc ashes	2	5	0
Off. aver., April	11	16	3 5/8
Aver. spot, April	11	13	4 5/8

LEAD.

	£	s.	d.
Soft foreign ppt.	10	18	9
Empire	11	11	3
English	12	15	0
Off. average, April	11	7	3½
Average spot, April	11	4	5½

ZINC SHEETS, &c.

	£	s.	d.
Zinc sheets, English	23	0	0
Do., V.M. ex-whf.	21	0	0
Rods	28	0	0
Boiler plates			—
Battery plates			—

ANTIMONY.

	£	s.	d.		£	s.	d.
English	35	0	0	to 42	10	0	
Chinese				24	0	0	
Crude				16	0	0	

QUICKSILVER.

	£	s.	d.
Quicksilver	15	15	0

FERRO-ALLOYS AND ST. EL-MAKING METALS.

Ferro-silicon—	
25%	£8 2 6
45/50%	£13 10 0
75%	£18 0 0
Ferro-vanadium—	
35/50%	12/8 lb. Va.
Ferro-molybdenum—	
70/75% c. free, of Mo.	6/3 per lb.
Ferro-titanium—	
23/25% carbon-free	9½d. lb.
Ferro-phosphorus, 20/25%	£21 0 0
Ferro-tungsten—	
80/85%	2/- lb.
Tungsten metal powder—	
98/99%	2/3½ lb.
Ferro-chrome—	
2/4% car.	£27 17 6
4/6% car.	£25 2 6
6/8% car.	£24 0 0
8/10% car.	£23 12 6
Ferro-chrome—	
Max. 2% car.	£37 17 6
Max. 1% car.	£47 2 6
Max. 0.70% car.	£49 17 6
70%, carbon-free	1/2 lb.
Nickel—80/99.5%	£225 to £230
"F" nickel shot	£217 10 0
Ferro-cobalt	8/3 lb.
Aluminium 98/99%	£95 0 0
Metallic chromium—	
96/98%	2/9 lb.
Ferro-manganese (net)—	
76/80% loose	£10 15 0 to £11 5 0
76/80% packed	£11 15 0 to £12 5 0
76/80% export (nom.)	£9 0 0
Metallic manganese—	
94/96% carbon-free	1/6 lb.

Per ton unless otherwise stated.

HIGH-SPEED TOOL STEEL.

Finished bars, 14% tungsten	2s. 0d.
Finished bars, 18% tungsten	2s. 9d.

Per lb. net, d/d buyers' works.

Extras—

Rounds and squares, 3 in. and over	4d. lb.
Rounds and squares, under ½ in. to ¼ in.	3d. lb.
Do., under ¼ in. to 7/16 in.	1/- lb.
Flats, ½ in. × ¼ in. to under 1 in. × ⅛ in.	3d. lb.
Do., under ¼ in. × ¼ in.	1/- lb.
Bevels of approved sizes and sections	6d. lb.

Bars cut to length, 10% extra.

SCRAP.

	£	s.	d.		£	s.	d.
South Wales—							
Heavy steel	2	2	0	to 2	2	6	
Bundled steel and shrngs.	1	17	0	to 1	18	6	
Mixed iron and steel	1	16	0	to 1	18	0	
Heavy cast iron				2	5	0	
Good machinery for foundries	2	7	6	to 2	10	0	
Cleveland—							
Heavy steel	1	15	0	to 1	17	6	
Steel turnings				1	11	0	
Cast-iron borings				1	6	0	
Heavy forge				2	15	0	
W.I. piling scrap				2	7	6	
Cast-iron scrap	1	18	0	to 2	0	0	
Midlands—							
Light cast-iron scrap				1	17	6	
Heavy wrought iron				2	10	0	
Steel turnings, f.o.r.				1	1	6	
Scotland—							
Heavy steel				1	17	6	
Ordinary cast iron				2	2	6	
Engineers' turnings				1	10	0	
Cast-iron borings				1	10	6	
Wrought-iron piling				2	2	6	
Heavy machinery				2	7	0	

London—Merchants' buying prices delivered yard.

	£	s.	d.
Copper (clean)	25	0	0
Brass	18	0	0
Lead (less usual draft)	10	0	0
Tea lead	8	0	0
Zinc	6	10	0
New aluminium cuttings	72	0	0
Braziery copper	22	0	0
Gunmetal	21	0	0
Hollow pewter	70	0	0
Shaped black pewter	50	0	0

PIG-IRON.

(f.o.t. unless otherwise stated.)

N.E. Coast—	
Foundry No. 1	61/-
Foundry No. 3	58/6
Foundry No. 4	57/6
Forge No. 4	57/-
Hematite No. 1	64/-
Hematite M/Nos.	63/6
N.W. Coast—	
Hem. M/Nos. d/d Glas.	72/-
,, d/d Birm.	84/6
Malleable iron d/d Birm.	117/6
Midlands—	
Staffs common*	—
,, No. 4 forge*	61/-
,, No. 3 fdry.*	66/-
Shrops basic	—
,, Cold blast, ord.	—
,, ,, roll iron	—
Northants forge*	57/6
,, fdry. No. 3*	62/6
,, fdry. No. 1*	65/6
Derbyshire forge*	61/-
,, fdry. No. 3*	66/-
,, fdry. No. 1*	69/-
,, basic*	—
Scotland—	
Foundry No. 1	72/-
,, No. 3	69/6
Hem. M/Nos. d/d	68/6
Sheffield (d/d district)—	
Derby forge	58/6
,, fdry. No. 3	63/6
Lincs forge	—
,, fdry. No. 3	63/6
E.C. hematite	75/6
W.C. hematite	83/6
Lancashire (d/d eq. Man.)—	
Derby forge	62/-
,, fdry. No. 3	67/-
Staffs fdry. No. 3	67/-
Northants fdry. No. 3	65/6
Cleveland fdry. No. 3	67/-
Dalzell, No. 3 (special)	102/6 to 105/-
Glengarnock, No. 3	86/6 to 87/-
Clyde, No. 3	86/6 to 87/-
Monkland, No. 3	86/6 to 87/-
Summerlee, No. 3	86/6 to 87/-
Eglinton, No. 3	86/6 to 87/-
Gartsherrie, No. 3	86/6 to 87/-
Shotts, No. 3	86/6 to 87/-

*d/d Black Country dist.

FINISHED IRON AND STEEL.

Usual District deliveries for iron; delivered consumers' station for steel.

	£	s.	d.		£	s.	d.
Iron—							
Bars (cr.)				9	15	0	
Nut and bolt iron	7	15	0	to 8	5	0	
Hoops	10	10	0	to 12	0	0	
Marked bars (Staffs) f.o.t.				12	0	0	
Gas strip	10	10	0	to 12	0	0	
Bolts and nuts, ¾ in. × 4 in.				12	0	0	
Steel—							
Plates, ship, etc.	8	15	0	to 8	17	6	
Boiler plts.	8	10	0	to 9	5	0	
Chequer plts.				10	7	6	
Angles				8	7	6	
Tees				9	7	6	
Joists				8	15	0	
Rounds and squares, 3 in. to 5½ in.				9	7	6	
Rounds under 3 in. to ¾ in. (Untested)				6	12	6 & up.	
Flats—8 in. wide and over				8	12	6	
,, under 8 in. and over 5 in.				8	17	6	
Rails, heavy	8	5	0	to 8	10	0	
Fishplates				12	0	0	
Hoops (Staffs)				9	10	0	
Black sheets, 24g.	8	0	0	to 8	10	0	
Galv. cor. shts.	9	5	0	to 10	0	0	
Galv. flat shts.	9	15	0	to 11	0	0	
Galv. fencing wire, 8g. plain				12	7	6	
Billets, soft	5	7	6	to 5	12	6	
Billets, hard				6	12	6	
Sheet bars	4	15	0	to 5	7	6	
Tin bars				4	15	0	

PHOSPHOR BRONZE.

	Per lb. basis.
Strip	10½d.
Sheet to 10 w.g.	11½d.
Wire	11½d.
Rods	11 d.
Tubes	16½d.
Castings	12½d.

Delivery 3 cwt. free.
10% phos. cop. £30 above B.S.
15% phos. cop. £35 above B.S.
Phosphor tin (5%) £30 above price of English ingots.
C. Clifford & Son, Limited.

NICKEL SILVER, &c.

	Per lb.
Ingots for raising	7d. to 1/1
Rolled—	
To 9 in. wide	1/1 to 1/7
To 12 in. wide	1/1½ to 1/7½
To 15 in. wide	1/1½ to 1/7½
To 18 in. wide	1/2 to 1/8
To 21 in. wide	1/2½ to 1/8½
To 25 in. wide	1/3 to 1/9
Ingots for spoons and forks	7d. to 1/3½
Ingots rolled to spoon size	10d. to 1/6½
Wire round—	
to 10g.	1/4½ to 1/11½

with extras according to gauge.
Special 5ths quality turning rods in straight lengths, 1/3½ upwards.

AMERICAN IRON AND STEEL.

At Pittsburgh unless otherwise stated.

	Dols.
No. 2 foundry, Phila.	15.59
No. 2 foundry, Valley	15.00
No. 2 foundry, Birm.	11.00
Basic	16.39
Bessemer	17.39
Malleable	17.39
Grey forge	16.89
Ferro-mang. 80%, seaboard	75.00
O.-h. rails, h'y, at mill	43.00
Billets	27.00
Sheet bars	26.00
Wire rods	37.00
	Cents.
Iron bars, Phila.	2.11
Steel bars	1.60
Tank plates	1.60
Beams, etc.	1.60
Skelp, grooved steel	1.50
Skelp, sheared steel	1.50
Steel hoops	1.65
Sheets, black, No. 24	2.20
Sheets, galv., No. 24	2.85
Wire nails	1.95
Plain wire	2.20
Barbed wire, galv.	2.60
Tinplates, 100-lb. box	$4.75

COKE (at ovens).

Welsh foundry	22/6 to 27/6
,, furnace	16/6 to 17/6
Durham and Northumberland—	
,, foundry	—
,, furnace	13/- to 13/6
Midlands, foundry	—
,, furnace	—

TINPLATES.

f.o.b. Bristol Channel ports.

I.C. cokes	20×14 per box	14/6 to 15/-
,,	28×20 ,,	29/- to 30/-
,,	20×10 ,,	—
,,	18¾×14 ,,	—
C.W.	20×14 ,,	—
,,	28×20 ,,	—
,,	20×10 ,,	—
,,	18¾×14 ,,	—

SWEDISH CHARCOAL IRON & STEEL.

Pig-iron	£6 0 0 to £7 0 0
Bars, hammered, basis	£16 10 0 to £17 0 0
Bars and nail-rods, rolled, basis	£15 17 6 to £16 5 0
Blooms	£10 0 0 to £12 0 0
Keg steel	£32 0 0 to £33 0 0
Faggot steel	£18 0 0 to £23 0 0
Bars and rods dead soft, st'l	£10 0 0 to £12 0 0

All per English ton, f.o.b. Gothenburg.
[Subject to an exchange basis of Kr. 18.16 to £1.]

XUM

DAILY FLUCTUATIONS.

Standard Copper (cash).

		£	s.	d.	
May	5 ..	30	5	0	inc. 1/3
,,	6 ..	29	12	6	dec. 12/6
,,	9 ..	29	12	6	No change
,,	10 ..	29	7	6	dec. 5/–
,,	11 ..	29	8	9	inc. 1/3

Electrolytic Copper.

		£	s.	d.	
May	5 ..	34	0	0	No change
,,	6 ..	34	0	0	,, ,,
,,	9 ..	34	0	0	,, ,,
,,	10 ..	33	15	0	dec. 5/–
,,	11 ..	33	15	0	No change

Standard Tin (cash).

		£	s.	d.	
May	5 ..	129	5	0	inc. 65/–
,,	6 ..	129	10	0	,, 5/–
,,	9 ..	124	10	0	dec. 100/–
,,	10 ..	120	0	0	,, 90/–
,,	11 ..	124	7	6	inc. 87 6

Tin (English ingots).

		£	s.	d.	
May	5 ..	130	10	0	inc. 62/6
,,	6 ..	131	0	0	,, 10/–
,,	9 ..	126	0	0	dec. 100/–
,,	10 ..	121	10	0	,, 90/–
,,	11 ..	126	0	0	inc. 90/–

Spelter (ordinary).

		£	s.	d.	
May	5 ..	13	0	0	No change
,,	6 ..	12	18	9	dec. 1/3
,,	9 ..	12	16	3	,, 2/6
,,	10 ..	12	10	0	,, 6/3
,,	11 ..	12	12	6	inc. 2/6

Spelter (Electro, 99.9 per cent.).

		£	s.	d.	
May	5 ..	15	0	0	dec. 5/–
,,	6 ..	15	7	6	inc. 7/6
,,	9 ..	15	7	6	No change
,,	10 ..	15	5	0	dec. 5/–
,,	11 ..	15	5	0	No change

Zinc Sheets (English).

		£	s.	d.	
May	5 ..	23	0	0	No change
,,	6 ..	23	0	0	,, ,,
,,	9 ..	23	0	0	,, ,,
,,	10 ..	23	0	0	,, ,,
,,	11 ..	23	0	0	,, ,,

Lead (English).

		£	s.	d.	
May	5 ..	13	10	0	dec. 5/–
,,	6 ..	13	5	0	,, 5/–
,,	9 ..	13	0	0	,, 5/–
,,	10 ..	12	15	0	,, 5/–
,,	11 ..	12	15	0	No change

AVERAGE MONTHLY PRICES OF UNMARKED BARS (SOUTH STAFFS).

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly average
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1898	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 6 6	6 5 0	6 5 0	6 5 0	6 10 0	6 10 0	6 2 11
1899	6 10 0	6 15 0	6 15 0	6 15 0	7 0 0	7 0 0	7 10 0	7 10 0	8 10 0	9 0 0	9 0 0	9 10 0	7 12 11
1900	10 0 0	10 10 0	10 10 0	10 10 0	10 15 0	10 15 0	10 5 0	10 5 0	10 5 0	9 10 0	8 15 0	8 15 0	10 1 3
1901	8 0 0	7 10 0	7 5 0	7 0 0	6 10 0	6 10 0	6 10 0	6 10 0	6 15 0	6 15 0	6 15 0	6 15 0	6 17 11
1902	7 0 0	6 10 0	6 15 0	6 15 0	6 15 0	6 10 0	6 10 0	6 15 0	6 15 0	6 15 0	6 10 0	6 10 0	6 13 4
1903	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 10 0	6 7 0	6 5 0	6 9 4
1904	6 5 0	6 5 0	6 5 0	6 5 0	6 10 0	6 5 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 2 11
1905	6 5 0	6 5 0	6 0 0	5 17 6	5 15 0	5 15 0	5 15 0	5 15 0	6 0 0	6 5 0	6 15 0	6 15 0	6 1 10½
1906	7 0 0	7 5 0	7 5 0	7 5 0	6 17 6	6 15 0	6 12 6	6 10 0	6 10 0	6 12 6	6 16 3	7 3 9	6 17 8½
1907	7 3 9	7 5 0	7 5 0	7 5 0	7 5 0	7 7 6	7 5 0	7 7 6	7 7 6	7 7 6	7 7 6	7 5 0	7 5 11
1908	7 2 6	7 0 0	7 0 0	7 0 0	6 15 0	6 7 6	6 5 0	6 2 6	6 2 6	6 2 6	6 2 6	6 0 0	6 10 0
1909	6 0 0	6 0 0	6 0 0	5 17 6	6 0 0	6 0 0	6 0 0	5 17 6	6 0 0	6 2 6	6 2 6	5 17 6	5 19 9½
1910	6 2 6	6 3 4½	6 7 6	6 7 6	6 7 6	6 7 6	6 6 6	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 5 7
1911	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 5 0	6 10 0	6 12 6	6 16 6	6 7 0
1912	6 18 9	7 1 10	7 2 6	7 8 9	7 18 9	8 0 7	8 2 6	8 3 6	8 5 0	8 6 3	8 7 6	8 8 9	7 17 0
1913	8 11 6	8 10 7½	8 10 0	8 8 1½	8 2 0	8 0 0	7 17 6	7 11 6	7 8 9	7 5 6	6 18 1½	6 17 6	7 16 9
1914	6 17 6	6 15 7½	6 12 6	6 10 0	6 10 0	6 10 0	7 11 10½	8 0 0	7 12 6	7 5 7½	7 5 7½	7 6 3	7 1 0
1915	7 11 6	8 5 11	8 8 9	9 6 0	10 3 2	10 19 2	11 12 6	11 13 1½	11 13 9	11 14 3	12 1 10½	13 0 9	10 6 0
1916	13 7 6	13 10 8	13 12 9½	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 3 9½
1917	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0	13 15 0
1918	13 15 0	13 17 3	13 17 6	13 17 6	13 17 6	13 17 6	13 17 6	14 15 0	14 15 0	14 15 0	14 15 0	14 15 0	14 4 5½
1919	15 10 0	16 5 0	17 15 0	17 15 0	20 15 0	21 0 0	21 0 0	22 0 0	22 0 0	22 0 0	22 0 0	22 7 6	20 1 8
1920	24 7 6	24 10 0	25 10 0	27 10 0	29 5 0	31 0 0	31 10 0	31 10 0	31 10 0	31 10 0	31 10 0	29 7 6	29 1 8
1921	26 17 3	25 0 0	23 0 0	21 0 0	19 0 0	18 5 0	16 0 0	16 0 0	15 14 0	14 0 0	13 6 8	13 0 0	19 4 5
1922	13 0 0	12 3 9	11 14 0	11 11 10½	11 5 0	11 3 6	11 2 6	11 5 0	10 17 2½	10 16 3	10 13 0	10 12 6	11 7 0½
1923	10 16 10½	11 3 1½	12 2 6	12 8 9	12 11 6	12 1 3	11 15 11½	11 15 0	11 15 0	11 15 0	12 13 6	12 8 3	11 18 10½
1924	12 9 6	12 10 0	12 10 0	12 15 7½	12 17 6	12 17 6	12 17 6	12 17 6	12 17 6	12 14 0	12 12 6	12 12 6	12 14 3½
1925	12 12 6	12 12 6	12 12 6	12 12 6	12 12 6	12 7 6	12 7 6	12 7 6	12 4 6	11 18 6	11 13 9	11 13 0	12 6 2½
1926	11 7 9½	11 5 0	11 5 0	11 5 0	11 3 9	11 3 9	11 5 0	12 0 0	13 0 0	*	15 7 6	12 19 0	12 0 2
1927	12 6 3	12 2 6	11 14 0	11 0 0	10 18 9	10 13 6	10 12 6	10 5 0	9 16 0	9 15 0	9 13 9	9 12 9	10 14 2
1928	9 12 6	9 12 6	9 11 0	9 10 0	9 8 4	9 5 0	9 5 0	9 5 0	9 5 0	9 5 0	9 3 6	9 1 3	9 7 0
1929	9 0 0	9 2 6	9 5 7½	9 9 4½	9 10 0	9 17 6	10 2 6	10 2 6	10 2 6	10 0 6	10 3 9	10 5 7	9 15 2½
1930	10 7 6	10 7 6	10 7 6	10 6 10½	10 6 3	10 5 0	10 2 6	10 2 6	10 2 6	10 2 6	10 2 6	10 4 7½	10 4 7½
1931	10 2 6	10 0 0	10 0 0	10 0 0	9 18 1½	9 17 6	9 17 6	9 17 6	9 17 6	9 17 6	9 17 6	9 16 10½	9 18 0½
1932	9 15 0	9 15 0	9 15 0	9 15 0	—	—	—	—	—	—	—	—	—

* No quotation available owing to strike.

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Correspondence should be addressed to the General Secretary, Institute of British Foundrymen, St. John Street Chambers, Deansgate, Manchester, from whom full particulars can be obtained of this service.

Any employer wishing to communicate with a candidate should write to the General Secretary, quoting identification number.

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